

Current History

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WORLD FOOD RESOURCES

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Current History

JUNE, 1975

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In this first issue in a two-issue symposium on world resources, seven articles explore population pressures and food resources across the world today. Our first article discusses food policy issues in the rich industrial nations and their impact on the world's poorer nations. "Food is a global issue," according to these specialists. "At the very least, the rich nations have a moral obligation to recognize and understand the global impact of their food-related decisions."

Food and Food Policy in the Industrial Nations

BY VERNON L. SORENSON

Professor of Agricultural Economics, Michigan State University

and

LARRY G. HAMM

*Research Assistant in the Department of Agricultural Economics,
Michigan State University*

OF THE MANY PROBLEMS vying for the world's attention, few are as critical and complex as the world food situation. Total world population was estimated to have reached 3.8 billion in 1973. At the current 2 percent annual increase rate, some 70 million new individuals must be fed each year.

With the exception of a few recent years, world food production has kept pace with this increase. Nonetheless, some nations have faced continual problems of malnutrition and sporadic outbreaks of starvation. Other countries have been concerned with excess production and low farm prices. Thus, depending on individual situations, perceptions of and approaches to the world's food problem differ.

"Developments since 1972 have caused widespread anxiety about the world's ability to produce and distribute enough food at reasonable prices to meet the increasing demands of growing populations and rising

incomes."¹ World food production declined 1.6 percent in 1972. After recovering somewhat in 1973, production again declined in 1974. These declines, coupled with increasing demand and the past policies of developed countries that restricted output, resulted in the near exhaustion of most of the world's food reserves. Food shortages appeared and prices skyrocketed.

The most severe price increases involved the major food grains, wheat and rice. Between the second quarter of 1972 and the first quarter of 1973, the prices of wheat and rice increased 250 percent and over 300 percent, respectively.² Between March, 1973, and March, 1974, the annual increase rate in consumer food prices in the OECD³ countries more than tripled the average annual increase rate of the period 1961-1971. High food prices and price uncertainty became major political issues in the developed economies. How the industrial countries respond to these issues will affect all nations.

The food situations of the developed and less developed nations are drastically different. The differences become apparent when the trends in production, consumption and trade are examined.

For the two decades, 1954 to 1973, the annual rate of increase in production was 2.7 percent in industrial

¹ See "The World Food Situation and Prospects to 1985," Foreign Agricultural Economic Report, no. 98, Economic Research Service, United States Department of Agriculture (Washington, D.C., December, 1974), pp. 1-11.

² *Ibid.*, p. 3.

³ The Organization for Economic Cooperation and Development countries include West Europe, North America, Japan and Australia.

countries and 3.0 percent in developing countries.⁴ Total production in the less developed countries actually increased faster than in the industrial countries, but the picture in per capita terms was reversed. Population growth rate between 1954 and 1973 was 1.0 percent in the developed countries, compared to 2.5 percent in developing countries. Thus, per capita food production increased only .4 percent per year in developing countries, compared to 1.5 percent per year in developed countries.

The largest component of the world's food production is grain. Differences in the rate of increase in grain yields further demonstrated the relationship between the two groups of countries. Between 1960/1962 and 1969/1971, the compound rate of growth in the grain yields of OECD countries was 1.9 percent. In the same period, yields increased by only 0.8 percent per year in less developed countries. In 1973, developed countries produced three-fourths of the world's food, yet had only two-fifths of the world's population. Since 1954, three-fourths of the increase in world food production and only one-fourth of the increase in world population occurred in the developed countries.

While per capita food production is higher in developed countries, so is per capita consumption. Between 1960 and 1971, the utilization of cereals in less developed countries averaged 168 kilograms per person. This compares with 813 kilograms per capita in the United States, 932 in Canada, and an average of 538 for all developed countries. In industrial countries, much of this grain is utilized in high-value, protein-rich products like meat, milk, and eggs.

Because of differences among countries in consumption and capacity to produce, significant and increasing quantities of food are treated internationally. In 1955, 45 percent of the world's total agricultural exports were accounted for by industrial countries. By 1972, this percentage had increased to 61 percent. Conversely, between 1954 and 1972, the share of world agricultural exports by less developed countries dropped from 45 percent to 28 percent. During this period, the greatest proportion of the exported food products of industrial countries went to other industrial countries.

Recently, the centrally planned economies (the U.S.S.R. and China) have increased their grain imports from the developed exporting nations. Also, as the populations of developing countries continue to press their production capacity, they have come to rely

increasingly on food imports, and especially on grains.

The position of the developed (OECD) economies in the world food situation, thus, is that: 1.) they have high consumption, 2.) their agriculture is highly productive, and 3.) the developing countries and the planned economies have come to depend more heavily on the industrialized countries for their food supplies.

FOOD CONSUMPTION IN DEVELOPED ECONOMIES

Growth in demand for food in developed economies has been rapid, primarily because of rising incomes. Population increases have played only a minor role. The rates of population growth between 1960/1962 and 1969/1971 for selected areas were: United States, 1.1 percent; the Economic Community (EC),⁵ 0.7 percent; Australia and New Zealand, 2.0 percent; and Japan, 1.1 percent. Incomes, on the other hand, have increased between 4 and 6 percent per year in most countries, and as much as 9 to 10 percent per year in some countries in some years.

A one percent increase in population can be assumed to create a one percent increase in the demand for food. But as incomes increase, a hierarchy of preferences for food creates changes in demand patterns. Meat and fruits are the preferred foods. For example, it is estimated that a 10 percent increase in income will result in a 7.9 percent increase in beef consumption in Japan, a 4.8 percent increase in the EC, and a 2.4 percent increase in the United States.⁶ As shown in Table 1, there have been dramatic increases in per capita meat consumption, most notably in Japan. Consumption of poultry, eggs, and other high-value foods has also increased.

Table 1: Per Capita Consumption of Total Red Meat*

	Average 1965-69	Average 1970 (kilograms)	Average 1972
United States	80	84	86
E.C. Average	53	57	59
Japan	8	12	15

* Carcass weight basis.

Source: *World Agricultural Production and Trade, Statistical Report*, Foreign Agricultural Service, United States Department of Agriculture (Washington, D.C., November, 1974), p. 7.

Further increases in the consumption of meat and animal products can be expected as economic growth continues. The greatest potential exists in Japan, but even in the United States large numbers of lower-income people consume much smaller quantities of animal products than they would if they had higher incomes. Further, on a worldwide basis, the demand for livestock products will expand even more rapidly than is indicated by income and population growth in the industrialized OECD countries. Recent massive Soviet grain imports occurred because of a deci-

⁴ Most of the data in this section comes from *The World Food Situation and Prospects to 1985*, *op cit.*, pp. 12-23.

⁵ Consisting of Germany, France, Italy, the Netherlands and Belgium-Luxembourg.

⁶ *The World Food Situation and Prospects to 1985*, *op cit.*, Table 37, p. 77. At the same time direct consumption of cereals and potatoes will tend to decline.

Table 2: Basic Data on the National Agriculture of Selected Developed Countries, 1970

Country	Population in Agriculture		Agriculture Gross Domestic Product (GDP)		Arable Land per person in agriculture	
	Thousands	Percent of Total	Million \$ U.S.	Percent of Total GDP	Hectares per person	
United States	8,192	4	29,087	3	21.30	
Canada	1,712	8	3,935	5	25.35	
Australia	1,046	8	2,562	7	42.47	
West Germany	3,506	6	5,542	3	2.15	
France	7,255	14	8,839	6	2.42	
United Kingdom	1,538	3	3,556	3	4.72	
Japan	21,564	21	13,834	7	.23	

Source: *The State of Food and Agriculture, 1973*, Food and Agriculture Organization, United Nations (Rome, 1973), Annex Table 13.

sion to increase the animal protein available for consumption by 25 percent over a five-year period. Also, some heretofore underdeveloped countries, like Taiwan, Korea and Portugal, are reaching income levels that create rapid increases in the demand for livestock products. This trend will continue to be the single most important determinant of food consumption patterns in all but the poor countries of the world, and will have a major impact on future needs for agricultural resources and improvements in the productivity of existing resources.

PRODUCTION IN INDUSTRIALIZED FREE WORLD COUNTRIES

High and increasing levels of consumption, plus the increasing purchases by Communist countries and the expanding requirements of less developed countries raise the question of basic production capacity of OECD countries. In aggregate, these countries have more than sufficient capacity for their own needs; however, this capacity is not evenly distributed. Japan is self-sufficient in rice, but imports vast quantities of feed grains and oilseeds to sustain her livestock economy. West Europe has a diversified agricultural sector. In 1972–1973, it produced 51.2 million metric tons of wheat. Even though this amounted to 15.3 percent of the world's production, West Europe was a net importer of wheat, and imported large amounts of grain and oilseeds for livestock production. Only the United States, Canada and Australia have the capacity to produce a substantial agricultural surplus.

The productive capacity of a country's agriculture varies depending on its agricultural resources, its technology, and the organization of its agriculture. Table 2 presents some data on the agricultural resources of several Western industrial countries. In all countries, the population devoted to and the income derived from agriculture are a small percentage of economy-wide totals. A very significant factor, however, is the amount of arable land available per person.

The United States, Canada and Australia are "new" countries. The ownership patterns of their land have

not been so rigidly established as those in Japan and Europe. As a result, farms have increased in size to accommodate new technology, and adequate land and improved technology have provided the basis for extensive crop production (Table 3). In 1972–1973, these three countries produced 18.8 percent of the world's wheat and 17.2 percent of its feed grains.

More significant, they accounted for 72.1 percent of wheat exports and 64.0 percent of feed grain exports. But this level of exports resulted in a substantial reduction in their reserve stocks, reserves that had been a major stabilizing force in world food markets. Reserve stocks in major exporting countries have declined to only 3 percent of annual world wheat and coarse grain consumption—only one-fourth of what they were at the beginning of 1972.

An important question is whether these stocks can be rebuilt and whether future growth requirements can be met. There is little doubt that through improved yields in most industrial countries output will continue to expand sufficiently to meet normal growth in domestic and international commercial requirements at least into the 1980's. The exporting countries also have some flexibility to increase land use, but this generally will require substantial capital outlays for clearing, drainage, irrigation, or other improvements.

Beyond these adjustments, output expansion will depend on the development and adoption of new technology. Increased agricultural output and productivity for most industrial countries during the post-war period have been based on a backlog of technology that farmers have used in increasing quantities during the 1950's and 1960's. While additional flexibility exists, we clearly are moving closer to the limit of gains that can be achieved by better use of available technology. Given the time required for developing new technology, a reemphasis on agricultural research to deal with problems of increased production beyond the mid-1980's is probably needed.

Agricultural policy also will play a role in shaping consumption, production and trade patterns. Since the 1930's, all countries have attempted to raise farm-

Table 3: Production and Exports of Wheat and Feed Grains in the United States, Canada and Australia, 1972/1973

	Production		Exports ^a	
	Million Metric Tons	Percent of World Total	Million Metric Tons	Percent of World Total
	Wheat and Wheat Flour			
United States	42.0	12.5	31.8	43.3
Canada	14.5	4.3	15.6	21.3
Australia	6.5	1.9	5.5	7.5
Totals	63.0	18.7	52.9	72.1
	Feed Grains			
United States	182.1	33.2	36.0	55.3
Canada	18.8	3.4	4.0	6.1
Australia	3.6	.6	1.7	2.6
Totals	204.5	37.2	41.7	64.0

^a Includes shipments from stocks.

Source: *Foreign Agricultural Circular* (FG 17-74), Foreign Agricultural Service, U.S. Department of Agriculture (Washington, D.C., August 20, 1974).

ers' incomes through programs that establish minimum prices for farm products. As a consequence, farmers have had the incentive to produce more than the market would absorb. Land was taken from production, especially in the United States and Canada, but large surpluses of commodities still developed. By 1961, the United States had feed grain stocks equal to 85 million tons and wheat stocks amounting to 1.4 billion bushels. These surpluses were either stored, given away domestically, or sold and given away overseas.

Then, in the mid-1960's a major shift in United States farm policy took place. Price supports to farmers were lowered to world market levels. The loss in income to farmers through the lower support price was offset by other forms of payments. Stock levels stopped growing. However, sometime else happened. Grain prices were lower and it became more attractive to feed grain to livestock. Livestock production increased. Farm policies of the developed exporting nations, in addition to raising farm incomes, accelerated a trend toward production and consumption of animal products.

Neither Europe nor Japan can produce enough feed to satisfy an increasing appetite for meat and livestock products. Thus, as diets improved, so did imports of feed grains. In 1973/1974⁷ Japanese feed grain imports reached 14.1 million metric tons, and West European countries imported 21.6 million metric tons.⁸

At the same time, grain exports to the Soviet Union, East Europe and the less developed countries increased. When the worldwide food shortfall of 1974 occurred, competition for the limited available stocks of both food and feed grain caused prices to rise to unprecedented highs. Prices increased most sharply in exporting countries. As a result, the United States instituted nonsystematic export controls. The future of relationships among surplus and deficit countries

is unclear and the need for international coordination in developing food and farm policy is apparent. What role will OECD countries play in solving the world food problem and alleviating the needs of the world's many poor countries?

FOOD POLICY ISSUES

The developed industrial countries occupy a unique position. Because they dominate the production of food, their policy choices directly affect the less advantaged people of the world. Economic and moral arguments indicate that the Western food-sufficient nations must examine and direct their food policies toward programs that will stabilize world markets, promote efficiency in the use of agricultural resources, and benefit less developed countries. Three interrelated policy issues are of central importance.

One set of issues centers around international agricultural adjustment and the effectiveness with which the world's agricultural resources are used. As the

(Continued on page 273)

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⁷ Crop years from October, 1973, through October, 1974.

⁸ *The World Food Situation and Prospects to 1985*, op. cit., Table 11, p. 21.

"The Soviet Union has adequate national resources to expand its food production significantly." Nonetheless, "It may be that there are important inefficiencies in the organization of Soviet agriculture."

The Soviet Grain Shortage: A Case of Rising Expectations

BY D. GALE JOHNSON

Professor of Economics, University of Chicago

THE SOVIET UNION has an enormous land area of 8.6 million square miles, compared to the 3.5 million square miles of the United States. However, a much smaller fraction of the total land area of the Soviet Union is suitable for farm production. The Soviet Union has approximately 1.5 billion acres of agricultural land compared to 1.2 billion acres in the United States. In terms of land actually cultivated or devoted to crops, the Soviet Union has 555 million acres or about 43 percent more land under cultivation than the United States.¹

However, the quality of Soviet land resources is lower. Some of the specific production problems of Soviet agriculture have their bases in the Soviet climate. The following comparison of climatic features of the two countries made by the former U.S.S.R. Minister of Agriculture, V. V. Matskevich, makes this clear:²

United States territory lies south of the 49th parallel, while only one-third of the agricultural land in the Soviet Union lies within this zone. In the U.S.S.R., only 1.1 percent of the arable land lies in areas with an annual precipitation of 700 millimeters [28 inches] while in the United States it is 60 percent. . . . Here 40 percent of the arable land lies in areas with an annual precipitation of 400 millimeters [16 inches], while in the United States it is 11 percent. . . . More than two-thirds of the area sown to grain crops in the U.S.S.R. is located in areas

with insufficient precipitation. . . . Severe and very severe droughts occur once in 3 years. . . . Only about 1 year out of every 3 or 4 can be considered more or less favorable. . . . The temperature ranges are also considerably different. In the U.S.S.R., 60 percent of the arable land lies within areas having an average temperature up to 5°C [41°F], while this is true of only slightly more than 10 percent in the United States.

The climatic conditions that prevail in the Soviet Union result in frequent droughts, affecting large areas. In addition, much of the farm area of the Soviet Union has a relatively short growing season and crops are frequently damaged by an early frost. The result is that there is substantial year-to-year variation in crop production, especially for the grains.

The less favorable climatic conditions as well as other features of Soviet agriculture have meant that a much larger area of land is cultivated; yet total farm production is less than in the United States. Carefully constructed estimates of total farm output indicate that for 1966–1971, Soviet output was from 77 to 91 percent as large as the farm output of the United States. The higher estimate was based on farm products priced in dollars in both countries, using United States farm prices, and the lower estimate was based on Soviet farm prices in rubles.³

Since 1950, farm output has increased more rapidly in the Soviet Union than in the United States. For the period 1950–1954, Soviet farm output was approximately 58 percent of the United States farm output. By 1960–1964, the output ratio was about 74 percent and for 1967–1971, about 85 percent.⁴

MEETING CONSUMER DEMAND FOR MEAT

The more rapid growth of farm production in the Soviet Union than in the United States has not solved the Soviet problem of satisfying consumer demand. As the real incomes of consumers increase, per capita demand for meat increases significantly. The Soviet Union is now a relatively high income country; it

¹ These data are from the Economic Research Service, U.S. Department of Agriculture, *Agriculture in the United States and the Soviet Union*, Foreign Agricultural Economic Report no. 92 (October, 1973), p. 2. This publication contains much useful data on Soviet agriculture with appropriate comparisons with the United States.

² *Ibid.*, pp. 2–3.

³ F. Douglas Whitehouse and Joseph F. Havelka, "Comparison of Farm Output in the US and USSR, 1950–71," in Joint Economic Committee, Congress of the United States, *Soviet Economic Prospects for the Seventies*, 93d Congress, 1st Session (Washington, D.C.: Government Printing Office, 1973), p. 359.

⁴ *Ibid.*, p. 358. The comparisons are based on the average of the output estimates in dollars and rubles.

achieved a level of per capita gross national product in 1973 greater than Italy's in the same year and approximately the same as the United Kingdom's in 1970. Yet Soviet per capita consumption of meat remains substantially below that of most of the countries of both East and West Europe, and is approximately half the United States level.

The Soviet Union has made major efforts to increase meat production during the past 15 years. Consumption has increased from 40 kilograms per capita in 1960 to 50 kilograms in 1973. However, this effort has been costly both in terms of resources and in money. In addition to very large investments in buildings and other facilities for livestock production, the decision at least to maintain the rate of production of livestock output that was made in 1972 following that year's poor crop resulted in very large grain imports from the United States and other exporting nations.

A further indication of the seriousness of Soviet policy makers in emphasizing meat and other livestock products is the large and ever increasing subsidy to meat and milk producers in the Soviet Union. Consumer prices of meat and milk products in state stores have not been increased, at least openly, since 1962. However, it was recognized in 1965 that livestock production was lagging because of limited profitability or actual financial loss. Prices paid to state and collective farms were then increased substantially. Since consumer prices were not changed, it was necessary to institute a subsidy. An estimate of the subsidy paid for meat and milk in 1973 was nearly 14 billion rubles, double the subsidy level of 1969.⁵

POPULATION GROWTH NOT A PROBLEM

Population growth in East Europe and the Soviet Union does not represent a significant drain upon resources. In 1972, the population growth rate in the Soviet Union was 0.9 percent; thus it would require approximately 80 years to double the population. In the East European countries, population growth rates ranged from -0.2 percent in East Germany to 1.0 percent in Romania. Thus, whatever difficulties these countries may have in satisfying consumer demand for food cannot be attributed to rapid rates of population growth.⁶

⁵ Constance B. Krueger, "A Note on the Size of Subsidies on Soviet Government Purchases of Agricultural Products," *Association for Comparative Economic Studies Bulletin*, vol. 16, no. 2 (fall, 1974), p. 66. Subsidies were paid on other agricultural products and the total for 1973 was 15 billion rubles. The subsidies on meat and milk amounted to 8 percent of the Soviet state budget in 1972 (*ibid.*, p. 65).

⁶ Bureau of the Census, U.S. Department of Commerce, *World Population: 1973, Recent Demographic Estimates for the Countries and Regions of the World*, 1973. The January 1, 1973, population of the Soviet Union was 248,626,000; the total population of Bulgaria, Czechoslovakia, East Germany, Hungary, Poland and Romania was 104,551,000.

TABLE 1: PER CAPITA MEAT CONSUMPTION, SOVIET UNION, SELECTED EUROPEAN COUNTRIES AND THE UNITED STATES

Country	Per Capita GNP (U.S. dollars) ^a	Per Capita Meat Consumption ^b (kilograms/year)
Soviet Union	2,643	48
Czechoslovakia	2,906	78
Bulgaria	1,724	41
East Germany	2,646	72
Hungary	1,976	80
Poland	1,761	61
Romania	1,731	38
Yugoslavia	1,110	37
Italy	2,269	50
West Germany	4,422	80
France	4,082	93
United Kingdom	2,908	76
Spain	1,416	41
Finland	2,898	45
United States	5,829	113

Sources: GNP, U.S. Arms Control and Disarmament Agency, *World Military Expenditures and Arms Trade, 1963-73* (Washington, D.C.: Government Printing Office, 1974). (Data are for 1973 and should be considered approximate.) Per capita meat consumption: Soviet Union and East Europe except Romania, Economic Research Service, U.S. Department of Agriculture, *Agricultural Statistics of Eastern Europe and the Soviet Union, 1950-70*, ERS-Foreign 349, 1973; other countries, Food and Agriculture Organization of the United Nations, *Production Yearbook*, 1971, vol. 25.

^a In U.S. dollars of 1972 purchasing power.

^b For countries other than Romania, data are for 1970; data for Romania are for 1964-1966. Except for Romania, data for the Soviet Union and East Europe include slaughter fats. Data for other countries do not include slaughter fats.

In the years before 1963, the Soviet Union had been a consistent and important grain exporter. From 1956 through 1962, net grain exports had averaged about 6 million metric tons. However, following a poor grain crop in 1963, net imports were 6 million tons and again, in 1965, 4 million tons were imported. Net imports were gradually increased until 1970-1971, when imports totaled 6 million tons. The need for additional feed supplies induced net imports in 1971-1972, even though the grain crop was the second largest on record. When grain production declined in 1972, net grain imports were 19 million tons, the largest amount of grain ever imported by a single nation in a single year. Even with a record grain production in 1973, there were net imports of nearly 5 million tons in 1973-1974.

It has been estimated that since 1962 approximately 80 percent of the year-to-year variation in world grain imports has been due to variations in Soviet Union imports. This large variation in imports seems to be a result of three factors: significant year-to-year variations in production; unwillingness to hold grain reserves in adequate quantities; and

policy decisions to prevent fluctuations in production from influencing internal prices.

The latter point may merit some explanation. In an economy like that of the United States, a significant change in the supply of a commodity affects the price of that commodity. In the Soviet Union, with fixed prices to producers and fixed prices to consumers, a change in supply is not permitted to affect prices. Sometimes the result will be that the commodity, like meat, may not be generally available. But higher prices are not permitted to induce consumers to change their consumption patterns. Nor will the producers of grain receive more when production is low; in fact, under Soviet pricing policies, a poor crop means that the average price received by a farm for deliveries to the state will fall. The reason for this is that higher prices are paid for above-plan deliveries. Obviously, when production is low, it is difficult to meet the plan deliveries, let alone to deliver extra products. Nor are farms that use grain for feed encouraged to economize in the use of grain when production is low. The price system is not permitted to reflect changing scarcity. The net effects of this policy are larger and more erratic changes in exports or imports than would otherwise be the case.

LIVESTOCK SUPPLY PROBLEMS

Soviet grain imports are no longer required to meet the requirements of direct human use of grain. The increase in grain production since 1950 has been large enough so that even with a very low grain yield there is adequate grain for bread, flour and other direct uses. In recent years, when Soviet grain production (official Soviet estimates) has ranged from 157 million tons to 230 million tons, the use of grain as food has been approximately 45 million tons.⁷ A great deal of grain is used as seed, compared to seed grain in other countries, averaging about 26 million tons. After making allowance for waste and industrial uses of grain, about 80 to 90 million tons of grain remains for feed.⁸

Grain imports are needed in the 1970's for livestock feed. For at least three years, feed imports have been required if livestock plan goals are to be met, even when weather is normal and grain and other feed production is average for normal weather. At least temporarily, the demand for livestock products seems to have outrun the ability of Soviet agriculture to produce adequate feed.

Why does the Soviet Union have difficulty in producing enough feed? It is not because current levels of consumption of meat are particularly high. As noted earlier, per capita meat consumption in the Soviet Union is much lower than in West Europe and is nearly the lowest in East Europe.

The demand for meat is growing at a rapid pace in the Soviet Union. The ninth five-year plan, which ends in 1975, assumed that per capita meat consumption would increase by 21 percent or approximately 4 percent annually. In fact, studies of the demand for meat in the Soviet Union indicate that consumption of meat might increase by as much as 6 percent per year, if prices remained unchanged. This rapid growth in the demand for meat is due, at least in part, to the fact that meat consumption had been held to low levels by past policies. The current situation reflects an effort on the part of the Soviet people to achieve a level of meat consumption that is consistent with their level of real per capita income.

FIXED PRICES

Another reason for the difficulty in meeting the growing demand for meat is the unwillingness of the Soviet government to increase the price of meat in the retail stores. The official prices have remained unchanged since 1962. As noted earlier, the higher costs of meat production as the supply has been expanded have been met by enormous subsidies. While retail meat prices have been and remain high in the Soviet Union relative to West Europe and North America, it is not surprising that output lags behind demand for a product for which the consumers pay less than two-thirds of the actual costs of production.

While the growth in demand for meat and other livestock products is rapid, this is not the only problem. Other factors are the poor quality of most feeds, especially with respect to protein content; high feed-livestock conversion ratios, and an inability to obtain reasonable yields for many feed crops. The high feed-livestock conversion ratios are in part due to the poor quality of feed, but they also reflect management practices plus the failure of the industrial sector to provide farms with antibiotics, mineral supplements and vitamins. The low level of protein production could be offset by imports of soybeans and similar products. If this route were taken, feed grain imports could be reduced by 2 to 3 tons for each ton of high protein feed imported. It is hard to understand why high protein feeds are not imported because of the money savings involved, unless Soviet officials believe that the farm supply system is incapable of adequately distributing the protein feeds.

The inadequate performance of the livestock sector cannot be blamed on low livestock prices. Livestock prices are high in comparison with those of all other countries, even significantly above the peak of

⁷ David W. Schoonover, "The Soviet Feed-Livestock Economy: Preliminary Findings on Performance and Trade Implications," Economic Research Service, U.S. Department of Agriculture, *Prospects for Agricultural Trade with the USSR*, ERS-Foreign 356, 1974, p. 30. Tons are metric tons.

⁸ *Ibid.*

prices reached in the United States in 1973 and 1974.

Some part of the poor performance of the Soviet livestock sector may be due to the organization of farms. While some livestock remain on the private plots, most livestock is held in the socialized sector. Milk output per cow in the Soviet Union is less than half the United States output. This very large difference may be due to one or more of several factors—the quality of the cattle, the quality of feed, management practices, or lack of incentives. Whatever the reasons, the much smaller output of milk per cow increases feed requirements per unit of milk by at least 25 percent. Beef production per head of cattle and pork production per hog are only about two-thirds of the United States levels. Thus a much larger fraction of the total feed goes for the maintenance of animals in the Soviet Union than in the United States. Conversely, this means that relatively less feed contributes to weight gain on meat animals or milk production by cows in the United States.

POTENTIALS FOR EXPANDING FOOD PRODUCTION

The Soviet Union has adequate natural resources to expand its food production significantly. There can be further irrigation, although the major potentials lie in the direction of more effective utilization of land that does not require irrigation. Much of the land in the European area of the Soviet Union, except in the Ukraine, is of relatively low fertility. However, the Soviet Union has all of the natural resources required to produce adequate supplies of nitrogen, phosphate and potassium fertilizers. While substantial increases in fertilizer production have been achieved since 1960, much more fertilizer will be required if food output is to increase significantly in the years ahead. As of 1970–1971, Soviet fertilizer use on farms was about 60 percent of the United States farm use.

Large areas of the European part of the Soviet Union would gain from more adequate drainage. Most Americans do not realize that tens of millions of acres of the most productive land in the American Midwest—the Corn Belt—has reached its present level of productivity as the result of an enormous and very expensive network of underground tiling for drainage.

But almost a quarter of a century of study of the Soviet Union has left me without a full understanding of the failure of Soviet agriculture to produce to its full potential. Grain yields have been increasing in the Soviet Union over the past decade, but they still remain significantly below the levels of acres with comparable climate and soils. In Finland, for example, with a less hospitable climate for growing grains than almost any part of the Soviet Union, grain yields are 50 to 100 percent higher than in the most comparable regions of the Soviet Union. Dur-

ing World War II the Soviet Union took from Finland some of its most productive farmland; this land is not now used for farming, perhaps because the Soviets cannot farm it profitably.

It may be that there are important inefficiencies in the organization of Soviet agriculture. The farms are very large, almost certainly too large for effective management. The incentive structure may not work well enough to bring forth the full attention and skills of Soviet farm people.

But the main reasons for the laggard performance of agriculture may well lie outside the farm sector. The Soviet press continuously emphasizes the poor quality of farm machinery, the frequent breakdowns of farm machines, the absence of spare parts, and the large number of tractors and combines that are inoperable at critical times of the year. There are inadequate grain handling and storage facilities; thus when the grain crop is large, a significant fraction of the crop is lost, because it cannot be dried and stored.

The Soviet industrial sector does not provide sufficient supplies of products required for healthy and productive livestock, like vitamins, minerals and antibiotics. When livestock and poultry are grown in confined quarters, as is more and more the case in the Soviet Union, disease control becomes a serious problem.

CONCLUSION

In spite of all of these difficulties, Soviet farm output has been increasing. In fact, the annual rate of output increase during the 1960's was slightly more than 3 percent, compared to only a little more than 1 percent in the United States. If Soviet farm output continues to increase at approximately 3 percent annually for the next decade, domestic demand and supply for farm products will come into approximate balance. However, if the rate of growth falls below 3 percent, unsatisfied demand for food will probably remain unless grains are imported. Even if Soviet output grows at this rate for the next several years, a low grain yield will force the Soviet Union to import significant amounts of grain if it is to maintain the expansion of its livestock production. ■

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"What is lacking in most Asian countries is the capacity to harness the collective will, the motivation to inspire, cajole, goad, and—if necessary—push the masses of peasants toward a modernization of farming techniques that is meaningful to their everyday lives. Neither international war-on-hunger symposia attended by well-fed political figures nor ecumenical 24-hour fasts in the industrialized countries will do it."

The Asian Dilemma: Reordering National Priorities

BY JAN S. PRYBYLA

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THE CONTINENT of Asia has an area of 10.8 million square miles and a population in excess of 2 billion, roughly half the population of the world on one-fifth of the world's land surface. Fifty-five years ago (1920), Asia's people numbered less than 1 billion. Before 1950, the rate of population increase in Asia was about 1 percent per year. Since 1950, this rate has more than doubled and currently stands at 2.3 percent per year, which means that in 1975, almost 50 million more people will be added to the already imposing assemblage of humanity inhabiting the continent. Should the present rate of population growth remain substantially unchanged in the years to come, the population of Asia in the year 2000 could exceed 4 billion, which is roughly the total population of the world at the present time.

The Asian continent contains some 30 countries. Of these, the People's Republic of China has about 860 million people, or roughly 40 percent of the total. Politically, the countries of Asia fall into two broad groups: non-Communist and Communist. In addition to the greater part of the U.S.S.R., the Communist countries include the People's Republic of China, the Mongolian People's Republic (Outer Mongolia), the Democratic Republic of Vietnam (North Vietnam), and the Democratic People's Republic of Korea (North Korea). Excluding the Asiatic part of the U.S.S.R., the total population of Asian Communist countries is about 910 million, or roughly 43 percent of the continent's total population. If the people of Asian Soviet Union are added (as well as those subject to the effective control of Communist forces in Cambodia, northeast Burma, and South Vietnam), the population living under Communist governments represents just about half the total population of the Asian continent and almost one-fourth of the population of the globe. In this assembly, the Chinese

numerically dominate the scene by far. In the language of political arithmetic, the fact that half the people of the Asian continent live under tight Communist rule is of profound historical significance. It represents a revolutionary transformation of the political picture since the end of World War II. In the short space of 30 years, the political color of Asia has changed beyond recognition, the more so since most Asian Communist regimes are of a fundamentalist, no-nonsense temper, impatient even with what they perceive to be the Soviet Union's revisionist, pro-European, pro-bourgeois, perhaps even pro-white drift.

In terms of economic organization the countries of Asia fall into two general classifications: market-oriented (non-Communist) and centrally planned (Communist) systems. Although the degree of market orientation and central planning varies (for example, Communist China is among the more decentralized of the administratively planned economies), the division is not in doubt. And so in Asia, as in Europe and in the Americas, there are today two distinct and in many ways conflicting politico-economic systems. Despite occasional attempts by both sides to conceal, or, at least underplay it, the political-ideological-economic division of man-made systems has important implications for the basic job of feeding, clothing, housing, and catering to the health of the multitudes.

In the great majority of Asian countries, Communist and non-Communist alike (Japan being the notable exception), from 60 to 80 percent of the population is engaged in agriculture. Although over the years the ratio of agricultural population to total population has been falling, the absolute number of people who try to make a living from the soil rises every year. In other words, the pressure of a quickly growing population on comparatively fixed farmland is constantly

Table 1: Calorie and Protein Requirements and Availabilities (per Head, per Day) in Asia*

Subregion	Total Requirements**		Total Availabilities		Deficiency (-) or Surplus (+)	
	Calories (number)	Proteins (grams)	Calories (grams)	Proteins (grams)	Calories (number)	Proteins (grams)
South Asia (Sri Lanka, India, Nepal, Pakistan, Bangladesh)	2,210	49.4	2,010	48.8	-200	- 0.6
East and Southeast Asia (Burma, Khmer Rep., Hong Kong, Indonesia, S. Korea, Laos, Malaysia, Philippines, Singapore, Thailand, S. Vietnam)	2,130	46.8	2,060	48.8	- 70	+ 2.0
Japan	2,142	53.6	2,470	76.9	+ 50	+23.3
Communist China	2,280	47.8	2,000	56.6	-280	+ 8.2
Other Asian Communist Countries (Outer Mongolia, N. Korea, N. Vietnam)	2,190	46.8	2,130	59.3	- 60	+12.5

* Near East Asia and Asian U.S.S.R. excluded.

** Variations because of climate.

Source: United Nations, "Population and Food Supply in Asia," *Economic Bulletin for Asia and the Far East*, vol. 35, no. 1 (June, 1973), p. 46, Table 5a.

increasing. Some of the more fertile areas of eastern China, for example, have a population density per square mile that approaches that of a fair-sized city. In 1970, arable land per head in China was about 0.1 hectares (1 hectare = 2.471 acres). Elsewhere in East and Southeast Asia it was 0.2 hectares per head.

Overcrowding on the land implies, in most cases, rural unemployment or underemployment for the many. Unemployment means that the person affected produces nothing and has to live off the surplus produced by his relatives or some larger social grouping. Underemployment often amounts to the same thing. The underutilized person adds little or no extra output, even though he—or more often she—works hard from dawn to dusk. His "marginal productivity," as the economists call it, is extremely modest or zero. It may even be negative, that is, counterproductive. Too many people on too little land with too few tools (capital) to help them along can get in each other's way and trample rather than improve the soil. In fact, over much of Asia, the marginal productivity of new entrants into the agricultural labor force is near zero, zero, or below zero. Using 1963 as a base year (1963 = 100), the per capita food production in Far Eastern Asia (Communist China excepted) in 1972 was 97. In Communist China it is believed to have been 110, but no one can really tell for sure.

Unable to live off the land, the peasants move to the cities in search of industrial jobs which, more often than not, are just not there. Rural joblessness is transformed by this massive flight from the land into an urban problem of staggering dimensions. The social

sewer that is Calcutta illustrates this in a convincing manner. Poverty, instead of spreading over a large area, comes to be tightly packed in a small acreage between city walls, resulting in highly visible and politically explosive human destitution and its companion, crime. For more than a decade now, the Chinese Communist authorities have banned uncontrolled migration into the cities and, in fact, have sent almost 10 million potentially unemployable young people from the towns to the countryside, where they are put to work on water conservation projects and in village industries when they are not needed in the fields.

A person's basic food requirement per day—the food intake needed to keep him in functioning order—can be established scientifically within certain fairly narrow limits. The basic norm will vary with age, climate, type of occupation, and so on. It can be expressed in two ways: 1) in terms of calorie intake, which measures the quantity of "fuel" needed to sustain the human organism, and 2) in terms of protein intake, which indicates the quality of the food consumed. Malnutrition may mean calorie deficiency, or protein deficiency, or both. Over most of Asia (Japan excepted) cereals are the most important contributor to the per capita availability of both calories and proteins. In South Asia and China, for example, at least one-third of the protein intake comes from cereals.

As can be seen from Table 1, all the subregions of Asia are calorie deficient, in varying degrees; in addition, South Asia is below the protein intake norm. Given the fact that in most of Asia a significant part

Table 2: Per Capita Income, Daily Supplies of Proteins from All Sources and from Animal Sources (1968)

Country	Calories (Per Day)	National Income (Dollars/Head)	Animal Proteins (Grams/Head/Day)	Total Proteins (Grams/Head/Day)
<i>Asian Developing Countries</i>				
India	1,810	73	5.4	45.4
Sri Lanka (Ceylon)	2,170	133	8.3	48.0
S. Korea	2,390	140	11.5	70.5
Pakistan	2,230	108	11.2	51.5
Thailand	2,140	127	9.9	46.0
Malaysia	2,400	68	16.3	54.3
Indonesia	1,980	95	4.5	38.2
Philippines	2,000	233	18.7	50.5
Communist China*	2,000	170	5.2	56.6
<i>"Western" Developed Countries</i>				
United States	3,200	3,303	68.6	95.6
France	3,100	1,738	59.9	100.7
Britain	3,150	1,560	53.8	87.5
West Germany	2,960	1,512	52.0	80.9
Switzerland	3,170	2,171	52.8	88.0
Canada	3,180	2,087	64.1	95.4
Australia	3,120	1,807	60.6	90.5
Japan	2,460	928	28.2	74.7

* Estimate. Communist China has published no comprehensive statistical series since 1960.

Sources: United Nations, *Yearbook of National Account Statistics*, 1968; Food and Agricultural Organization of the United Nations, *Production Yearbook*, 1968.

of protein is derived from cereals and pulses (e.g., more than 70 percent in Pakistan, compared with 17 percent in the United States),¹ the protein deficiency would be eliminated if the basic calorie requirements were met through an increased production and consumption of grains. The proviso "production" is important. Production is in part a function of technique. Consumption by the masses of the people (not just by a privileged few) is largely a matter of social organization, mainly of income sharing or, at any rate, of the determination by a nation's public authorities to distribute what is produced equitably.

The figures in Table 1 conceal the fact that those most affected by calories and/or protein deficiency are those who are most disadvantaged in any socially determined inequitable system of income distribution; i.e., the poorest among the poor. Seen in this light, the problem is less acute in China (—280 calories, *average*) than in, say, Ceylon (roughly —40 calories, *average*). Table 1 suggests that a great many people in Asia are not getting enough food to function properly, and that their diet is qualitatively unbalanced. Food surpluses over minimal consumption needs are small even at the best of times. In a bad year, they can be wiped out with resulting widespread hunger. Again,

in Communist China, food reserves put aside during good harvest years appear to be adequate at the present time to cushion the effects of less generous years, like 1972.

Malnutrition reduces labor productivity. What is more serious, it has deleterious effects on intelligence, resistance to disease, and size. In short, malnutrition leads to an inherently inferior work force.² Inferior labor, in turn, has a retarding effect on economic development, which is a major means of improving the nutritional standards (i.e., the health) of the people. There is a fairly close and positive correlation between per capita availability of calories, proteins, and income levels, as shown in Table 2.

THE BASIC CONTRADICTION: POPULATION AND FOOD SUPPLIES

There can be little doubt that the key problem in improving the dietary standard of the peoples of Asia is the contradiction between the rate of population growth and the rate at which food output increases. The high rates of population growth characteristic of most Asian countries mean large absolute additions to the population every year. For example, even if one grants Communist China's success in lowering her rate of natural increase in recent years (an achievement hinted at by China's leaders), a 1.8 percent annual rate of increase translates itself into more than 15 million extra people to be fed, clothed, housed and ministered to every year. This is about 15 times the number added to the population of the United States in a typical recent year. In such circumstances,

¹ John C. Abbott, "The Efficient Use of World Protein Supplies," Food and Agricultural Organization of the United Nations, *Monthly Bulletin of Agricultural Economics and Statistics*, vol. 21, no. 6 (June, 1972), pp. 1-8.

² Pedro Belli, "The Economic Implications of Malnutrition: The Dismal Science Revisited," *Economic Development and Cultural Change*, vol. 20 (October, 1971), pp. 1-23, and comments by W. T. Wilford, *et al.*, and reply by Pedro Belli, *ibid.*, vol. 23 (January, 1975), pp. 337-357.

Table 3: Rate of Population Growth and Rate of Growth of Food Production, 1952-62, and 1962-72 (Percent Per Year)

Region	Population	1952-1962		Population	1962-1972	
		Total	Per-Head		Total	Per-Head
Market-oriented economies of the Far East	2.3	3.1	0.8	2.5	2.7	0.2
Asian centrally planned economies	1.8	3.2	1.4	1.9	2.6	0.7
Market-oriented developed economies (W. Europe, N. America, Oceania)	1.2	2.5	1.3	1.0	2.4	1.4
East Europe and U.S.S.R.	1.5	4.5	3.0	1.0	3.5	2.5

Source: Food and Agricultural Organization of the United Nations, "Population, Food Supply, and Agricultural Development," *Monthly Bulletin of Agricultural Economics and Statistics*, vol. 23, no. 9 (September, 1974), p. 2, Table 1. For country-by-country breakdown, see *ibid.*, pp. 3-4, Table 2.

much, if not most, of the surplus product generated by the economy in any given year has to be channeled into immediate food consumption and the provision of essential social overheads, like dwelling houses, roads, schools and clinics. Little is left over to accumulate in the form of direct aids to production (machines, industrial plant and equipment) that would help boost productivity and raise the national income. The choice, as we shall see, is not so clear-cut, but runaway populations do put sharp restrictions on the economic choices of governments in the area. Table 3 illustrates the basic contradiction.

According to another set of United Nations calculations, the per capita production of food in South Asia did not increase at all in the decade from 1960 to 1970, while total agricultural production per head actually declined by 0.1 percent per year.

POPULATION

There are no two ways about it: the rate of population growth in Asian countries must be halved—pushed down to 1 percent, preferably below that. The old Malthusian specter of people outrunning food supplies and, by this very proliferation, triggering the "positive checks" of mass starvation, war, civil disorder, plagues, and other "vices and miseries" is not a scarecrow raised to frighten poor nations into submission. It is a proximate possibility; in some places it is a present reality. World food reserves, which a few years ago were good for 80 days, are now down to 20 days. Of all the regions of the world, only

North America produces significantly more than it consumes, and exports yearly about 8 percent of the world's total grain output.³ Any proposed solution to the problem of widespread and acute malnutrition must start with an attack on population growth. Moreover, grain production will have to grow much more rapidly than population because of the changing pattern of food consumption in the industrialized countries, i.e., their rising demand for protein diets based on meat. Increasing amounts of grain are being siphoned off to feed cattle and pigs.⁴

The rate of population growth in any country is largely a function of its social environment. In economically backward, rural communities, a big family is in the nature of a social insurance operation: in the absence of public provision for infirmity and old age, it is expected that one's kin, especially one's children, will take care of the problem. In the meantime, the more children there are around the house, the more labor there is to work on the family farm. In some rural communities, a large family is a sign of respectability and virility, the two being often equated in the popular mind. Large families are also encouraged by many religious beliefs. Thus, public action in favor of family limitation will usually meet with opposition from the population at large. It may also be delayed and hampered by ideologies that equate large numbers of citizens with the strength of the nation or the class.

But there are other down-to-earth reasons for the apparent failure of many Asian governments to lower the birth rate. Family planning programs represent a tangible short-term drain on the state treasury; they call for a large and sustained educational effort and a sizable paramedical personnel willing and able to go out to the villages to help the people understand and implement the program through the proper and timely use of birth control devices and methods. All these problems have been encountered by India in her attempt to stem population growth. Despite the government's effort to disseminate birth control information services and supplies, the prospect of a billion Indians by the year 2000 is not at all fanciful.⁵

In Communist China, the demographic picture is

³ Philip Handler, "The State of Man," *War on Hunger: A Report of the Agency for International Development* (Washington, D.C.: AID, 1975), p. 2.

⁴ Michael T. Malloy, "The Next Crisis: Universal Famine," *Skeptic*, special issue no. 2 (July-August, 1974), pp. 19-21.

⁵ Sripati Chandrasekhar, "A Billion Indians by 2000 A.D.?" *The New York Times Magazine*, April 4, 1965; Thomas E. Dow, Jr., "The Population of India," *Current History*, vol. 54, no. 320 (April, 1968); Government of India, "Family Planning in India," in Planning Commission, *Fourth Five-Year Plan—a Draft Outline* (Delhi, 1966). These studies are reprinted in Kuan-I Chen and Jogindar S. Uppal, *India and China: Studies in Comparative Development* (New York: The Free Press, 1971), pp. 187-201.

beginning to look slightly brighter. At least since the early 1960's, the government has pursued a vigorous birth limitation (or, as they call it, "birth planning") policy, backed by a million-strong network of paramedical public health personnel in both city and country (the so-called "barefoot doctors"), and a growing supply of birth control gadgets. As one Chinese public health official put it to me, "the barefoot doctors not only distribute the pill, but make sure that it is swallowed." Ideological obstacles to family planning have been rationalized out and shunted aside with the aid of dialectical logic; a logic in which one plus one does not forcibly add up to two, and black and white do not necessarily merge into grey. Above all, enormous organized peer group pressure is put on everyone to conform to the birth control policy. "Modern fertility control methods and devices are supplemented by "traditional" procedures, mainly by the enforced postponement of marriage and an ethic that condemns extra-marital relations. Although since 1950 the legal marriageable age is 18 for women and 20 for men, no one under 26 is likely to obtain a marriage license from the competent local authority. A recent study prepared for the Committee on Foreign Affairs of the United States House of Representatives concludes that:

considering the starting point and the size of the overwhelmingly rural population, China has made impressive progress in a relatively short period of time. Furthermore, she is likely to be the first developing nation of any size to reduce the growth of her population to below one percent per year.⁶

In the absence of officially published data, it is believed that the rate of natural increase in China has been brought down from around 2.3 percent in the 1950's to below 2 percent (around 1.7 to 1.8 percent) at the present time. There is, of course, a long way to go, but the indications are that the family planning effort and the required response are there.

That the rate of natural population increase can be

⁶ *China's Experience in Population Control: The Elusive Model*. Prepared for the Committee on Foreign Affairs, U.S. House of Representatives, by the Congressional Research Service, Library of Congress (Washington, D.C.: U.S. Government Printing Office, September, 1974), p. 45.

⁷ *Statistical Handbook of Japan 1969* (Tokyo, 1970); *U.N. Demographic Yearbook, 1972*; *Japan Statistical Yearbook, 1971* (Tokyo, 1972).

⁸ F.A.O., *Monthly Bulletin of Agricultural Economics and Statistics*, vol. 23, no. 9 (September, 1974), p. 2.

⁹ There is also the threat that the supply of water, a key factor in much Asian farming, will become progressively scarcer as irrigation systems are expanded. The growing demand for water means increasing resort to costly, capital-intensive methods of obtaining such water (e.g., deeper wells, desalinization).

¹⁰ Malik Khuda Bakhsh, "Agricultural Development in Pakistan," in *Strategy for the Conquest of Hunger* (Proceedings of a Symposium Convened by the Rockefeller Foundation) (New York: The Rockefeller Foundation [n.d.]), p. 41.

compressed is illustrated by the demographic history of Japan since the 1930's. The average annual rate of population increase from 1933 to 1937 was 1.7; after World War II (1947-1949) it jumped to 2.1. From 1950 to 1954, the population increased by 1.4 percent per year on the average. The increase in 1971 was about 1.2 percent. The decline since 1950 has been due almost entirely to family planning in both urban and rural areas. In 1950, the average number of family members was 5.02. In 1973, it was 3.4, and the difference between average family size in urban and rural areas was small (2.7 in Tokyo; 3.1 in the predominantly rural Kochi Prefecture).⁷ Of course, the experience of one country cannot be exactly duplicated in another; numerous specific historical, cultural, and economic circumstances must be taken into account in each case. However, the Japanese experience with population control points up an interesting lesson, namely, that the rate of "natural" increase is amenable to social action and that, in the words of one study: "the crucial factor has not been the rate of population growth itself, but the response of governments and, with their help, of farmers to this rate."⁸ What is natural need not be inevitable. To a significant extent, man has the capacity to bend nature to his will. The explosive variable is time.

FOOD

The conclusion applies also to the other side of the survival equation: the production of food. Food output is partly a question of techniques of production, partly (perhaps mainly) one of the social organization.

The major technical limitation consists of (a) the relatively restricted amount of land in many areas of Asia suitable for agriculture,⁹ and (b) the primitive state of agricultural arts. For example, only 12 percent of China's land area is now thought to be usable for agricultural production, and a giant reclamation effort (which is, in fact, being undertaken) might, with luck, add another 1 to 2 percent. By contrast, in Pakistan, roughly 30 percent of the land was suitable for farming some years ago.¹⁰ With the emergence of Bangladesh as an independent state, this agricultural area has been considerably trimmed. The arts of production in agriculture range from traditional (e.g., man- or animal-power), through intermediate (e.g., a 7 h.p. motor hitched to a redesigned plow), to

(Continued on page 275)

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"For the time being, to regard demographic pressure as an acute national issue is legitimate in only a few cases. This is not to deny that some Latin American countries may suffer imbalances between land resources and human needs. But today they do not seem to lack the physical ability to sustain a population of their present dimension. Concern over the problem is nevertheless sensible."

The Land-Population Balance in Latin America

BY NICOLÁS SÁNCHEZ-ALBORNOZ

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READING THE yellowing pages about Latin America printed half a century ago, a sense of smooth progress emerges. The region was apparently able to provide the industrial world with luxury items and basic staples and to feed millions of people overseas as well. The agricultural produce easily sustained the 90 million inhabitants who lived at that time in the southern part of the American continent. Of course, pockets of poverty persisted, and eventually agrarian uprisings, like the Mexican revolution, proved that such a contrived image tended to ignore existing problems.

However, strains did not seem to arise because of any particular deficiency, but rather because potential resources were kept idle and semifeudal structures were improperly alive. To relieve these problems, a modern sector could have been developed in agriculture which, stepping up the nations' overall output, would alas have set an example for land exploitation and rural social relations. Half a century ago, large tracts, controlled by various governments, remained unoccupied everywhere and were offered to lure settlers. European immigrants were flocking into the same countries that had attracted them before World War I. The prospects for a steady population and agricultural increase seemed bright.

Shortly afterward, the Great Depression wiped out long entrenched faith in Latin America's latent ability to grow. During the 1930's, agricultural prices tumbled in the international markets. Cultured areas that had recently shifted from subsistence to cash crops were left unharvested. Other areas had to destroy their agricultural production. Brazilian locomotives burnt coffee beans instead of coal. New immigrant arrivals stopped; no government welcomed foreigners. With regard to population, nationalist feelings were expressed by the dictum: "children are the best migrants." The response to the economic crisis was instinctive: industrialization would foster internal

development; manufactured imports had to be substituted; agriculture would subsidize the desired transformation.

During the Depression, those countries most vulnerable to changes in world trade suffered a temporary demographic setback: marriages and conceptions were postponed, and the birth rate went down by as much as 10 percent. But as soon as the Depression ended, Latin American countries began to increase their population again. From 1940 to 1950, the area gained 55 million inhabitants, 52 percent. In the next two decades, from 1950 to 1970, population rose to 119 million (an increase of 75 percent). Thus, during the last half century, the overall Latin American population increased 233 percent to approximately 311 million people.

THE DEMOGRAPHIC EXPLOSION

Each year, nearly as many people as those living now in four Central American states (Honduras, Nicaragua, Costa Rica and Panama) are added to the subcontinent. No other area of the world has ever grown at such speed. How was this pace achieved? An abrupt decline in the general death rate and a rise in the fertility rate sparked the population explosion. The fall in the annual proportion of deaths does not seem related to any substantial improvement in health conditions or to an increasingly varied and abundant diet. In many instances, agricultural output did not increase at the same rate as the population.

Latin Americans of the last two generations have survived in larger numbers thanks in large part to the new drugs and new techniques of medical care after World War II. Life expectancy jumped from 33.6 years in 1930 to 60.6 years in 1970. Now Latin American children of both sexes have better chances of reaching old age than their grandparents. Five children out of 100 born still die during their first year of life. Sixteen out of 100 children died during the same period half a century ago.

Endemic diseases have been uprooted because of the widespread use of insecticides and antibiotics. Tropical lowlands are almost free from malaria, yellow fever and other local infectious diseases. Precisely, these territories account for a large share of the general growth. Women with a prolonged lifetime also are exposed longer to the risk of becoming pregnant. Thus, they give birth to more babies during their childbearing years, and a greater number of their offspring also survive.

During this demographic outburst, only a few additional thousands of square miles were cultivated, not enough to harbor the surplus rural population. By 1930, the occupation of the virgin soils of the temperate prairies had been completed. Smaller tracts of lands could have been brought under cultivation here and there in Latin America, but this would have been achieved at the expense of higher capital investments and human effort. Therefore, no spectacular gains were to be expected. The tropical forests remained as an unspoiled vegetal reserve; but people have seldom dared to move into this still open frontier.

In spite of this lack of geographical expansion, rural areas could have prevented the population exodus if work and wages comparable to those paid by industry had been available. But this did not happen. To enhance agricultural opportunity, a rapid agricultural transformation—to high intensive methods of land cultivation—was required. But scarce local capital did not look to agriculture for investment opportunity. Instead, local capital sought high returns in industry. After World War II, also, the international trend in agricultural prices declined persistently. This trend favored livestock, which required a smaller manpower input.

Meanwhile, labor-saving machines were introduced. A serious reform of the land tenure system to attract the peasants was not attempted. Attracted by the higher standard of living that he might expect to find in the cities, the country dweller drifted to the urban centers. Although the rural population did not shrink in absolute numbers (except in few instances), the demographic increment was absorbed mainly by the towns. During the last 30 years, the population explosion has transformed Latin America from a rural and agricultural region into a markedly urban, but not yet industrial, area.

The enlarged urban population must be fed by relatively fewer agriculture workers, although no compensatory upturn in productivity has taken place. By 1960, the output by acre was only 16 percent higher than it had been a couple of decades earlier.

If there is no simultaneous rise in the cultivated

surface or in land productivity, a rapid population growth, aggravated by a population concentration in urban areas, either reduces the agricultural surplus left for export or brings the domestic level of consumption down, if the country decides that it needs to earn foreign currency. A third alternative, equally detrimental, is to spend monetary reserves to import food. Chile, a grain exporter during the last century, has for decades been spending much of what she has earned by mining copper in order to feed her population.

Recent forecasts estimate that by the end of this century Latin America will be inhabited by some 645 million people, twice the size of its present population. This represents a 2.5 percent accumulative annual rate of growth, slightly below the current rate (2.8 percent). Although the most violent demographic eruption will be decreasing, the population will still be expanding very fast. If present trends in human fertility and in agricultural productivity remain unchanged up to the year 2000, a gap may develop between resources and needs, and the region may be forced to import food. England and Japan faced the same problem when they became industrialized, but they managed to expand nonetheless. The questions remain: will Latin America attain a level of economic development by the end of this century that will allow it to pay in manufactured goods for necessary food? Given the current prospects, will other areas of the world have surpluses to sell on the scale Latin America might require?

Both alternatives appear doubtful. Consequently, only two options remain open: contraception or agricultural expansion. Neither of these excludes the other. It does not make much sense to review the issue further in general terms. Latin America confronts no single population or agricultural problem, but a variety of them. Physical and human conditions vary widely from one country to another. No political unity covers the area; each nation thus approaches the problem differently.

DISPARITIES

Several figures on Latin American land and population are given for each country (including Puerto Rico) in Table 1 (see page 256). For the sake of brevity, only very specific indicators have been stated. For instance, instead of the volume of the total population, Table 1 shows totals only for the male agricultural labor force (column 4).¹ If needed, that volume, as well as those of the rural population and the total male labor force, can be easily figured out from the rates included in columns 3, 5 and 6. Similarly, column 1 conveys the extent of national territory allotted specifically to agriculture (defined as arable land plus pastures). The overall dimension of each country is implicit in the proportions contained in col-

¹ Since census bureaus do not use uniform categories to assess women's role in the labor force, only the male segment (above 15 years of age) is provided, in order to avoid inconsistencies.

Table 1: Land and Population in Latin America, Selected Indicators c. 1960

	1 Total agr. land (in 1,000's of sq. km.)	2 Agr. land/ total area (percent)	3 Rural/total population (percent)	4 Agr. labor force (in 1,000's)	5 Agr./total labor force (percent)	6 Total pop./ agr. labor force	7 Ratio, col. 4 to col. 1	8 Future to- tal fertility rate (estimate for year 2000)
Continental								
Central America								
Mexico	1,029	52.1	49.3	5,215	59.1	6.9	5.0	4.5
Guatemala*	20	19.0	75.0	562	73.7	5.4	27.0	4.5
El Salvador	12	58.6	61.8	418	69.5	6.0	33.3	6.0
Honduras	37	32.9	78.3	325	74.2	5.7	8.5	5.3
Nicaragua	24	18.7	60.6	254	76.6	5.9	10.4	5.5
Costa Rica	13	27.6	65.2	162	56.4	7.7	11.6	3.2
Panama	13	18.0	58.5	140	54.6	7.3	10.2	4.4
Caribbean								
Cuba	37	32.6	43.4*	746*	46.4*	7.4	19.9	3.2
Puerto Rico	5	63.9	55.8	125	27.7	18.9	21.9	2.5
Dominican Rep.	19	39.6	69.7	496	67.7	6.3	25.6	5.5
Haiti*	8	31.3	87.8	758	87.3	4.4	87.1	5.6
Tropical								
South America								
Brazil	1,510	17.7	54.9	9,548	54.2	7.3	6.3	4.3
Colombia	196	17.2	51.0	2,064	57.5	7.7	10.5	4.3
Peru	127	9.8	59.1	1,261	53.9	7.9	9.9	4.4
Ecuador	—	—	67.0	669	62.1	6.4	—	5.0
Bolivia*	—	—	79.5	478	66.6	6.3	—	5.2
Venezuela	189	20.7	37.5	666	37.0	11.6	3.5	3.8
Temperate								
South America								
Argentina	1,377	49.6	33.0	1,344	22.8	15.5	0.9	2.4
Chile	141	19.0	35.3	617	33.8	12.7	4.3	3.1
Uruguay	160	85.8	27.9	167	22.9	15.2	1.0	2.4
Paraguay	—	—	65.6	266	63.9	6.5	—	4.6

* c. 1950

Sources: Columns 1 to 5 and 7: J. Kumar, *Population Land in World Agriculture. Recent Trends and Relationships* (Berkeley: Institute of International Studies, University of California, 1973). Column 6: estimation. Column 8: Centro Latino Americano de Demografía (CELADE), *Boletín demográfico*, 8, 1971.

umn 2 and can be reckoned from them. Column 7 represents a ratio between the two absolute values mentioned before: agricultural land and labor force. It indicates the average number of farmers and cattlemen who work in each square kilometer of cultivated land or pasture. Finally, the total fertility rate is given (column 8) in order to anticipate future demographic problems. This coefficient indicates how many children the average Latin American woman will have during her childbearing age at the end of this century.²

Only a small fraction of the surface is profitably used for agriculture in Latin America. Not even one-

² Note that few countries have any reliable data on how they use their land and that some others lack systematic information for the period after 1950. Note also that the smaller the country is, the clearer its features appear. Mexico, Brazil and Argentina combine too many physical and human traits that are diluted in national averages.

tenth of Peruvian land was exploited 15 years ago. Vast barren highlands and dense tropical forests mean that only the western coastline has turned to fruitful operation. The case of Peru is particularly inauspicious. But in seven nations (Guatemala, Nicaragua, Panama, Brazil, Colombia, Venezuela and Chile) less than one-fifth of their land is economically active. Except for Chile, these countries are located in tropical central and South America, where humid forests remain, to a large extent, unproductive. Northern Chile possesses dry infertile tracts at sea level or in the highlands, similar to those in southern Peru. Nature is certainly hostile, but it could yield more.

Uruguay and Puerto Rico, homogeneous physically, have high proportions of soil in use. Broken down by regions, Argentina exhibits large pastoral and farm areas alike. But because Patagonia's wasteland is included in the national average, her average is reduced.

Earth utilization, however, is not intensive in the Rio de la Plata area. A small number of people live or work in the countryside. Fewer than one-third of the Argentinians and Uruguayans lived in that area 15 years ago (column 3). Today the proportion would be even smaller.

If one compares people who live in rural areas (column 3) with people who earn a living from the land (column 5) in Argentina, Uruguay and Puerto Rico, one can see that the residence rate is higher than the manpower rate.³ In 1960, approximately half the Puerto Ricans were rural dwellers, but little more than one-fourth of the labor force was engaged in agriculture. The rates for the Argentinians were 33 and 22.8 percent respectively; for the Uruguayans 27.9, and 22.9 percent. Such imbalance between rural residence and occupation is characteristic of an advanced stage of development. In Puerto Rico, it can be explained by the recreational facilities that are spread over the land, whose employees are neither farmers nor cattlemen. In the Rio de la Plata, the imbalance is due to the variety of services demanded by a sophisticated agriculture, which allows rural residents to be engaged in nonagricultural jobs. On the other hand, most Central American republics, the island of Hispaniola, some Andean countries like Ecuador and Bolivia, and Paraguay as well, keep at least two-thirds of their active population in agriculture. Thus, the average number of individuals to be fed by each rural worker (including females, children, elders and urban dwellers) is still low in these countries: nearly five in Haiti, close to six in Guatemala, El Salvador and Nicaragua, just above six in the Dominican Republic, Ecuador, Bolivia and Paraguay, and so on. Generally speaking, these nations belong to the group that at most takes advantage of one-fifth of their land. Sizable rural manpower and underused soil, combined with poor productivity, yields poverty.

As soon as the active population in agriculture diminishes in proportion to the total population, farmers and ranchers must feed more people. Each Venezuelan rural worker is supposed to feed almost 12 people; each Argentinian or Uruguayan more than 15; finally each Puerto Rican, nearly 19. There is clearly a critical demographic plethora in Puerto Rico, where most of the soil is already used.

Another country that approaches saturation for different reasons is also located in the Caribbean. Haiti exhibits a low ratio of total population to rural

manpower and, on the other hand, can only cultivate less than one-third of her land. Too many hands till the earth in Haiti: 87 men per each square kilometer (column 7). Any badly needed mechanical improvement will leave many of them out of work.⁴

In summary, we may distinguish three major cases with many nuances. First, there are countries with a high proportion of the land under exploitation, but with low rates of rural population and of agricultural labor force. Their labor forces are scattered in vast areas and sustain a relatively high total population. No sign of population pressure is found in these countries, which include the Rio de la Plata area.

Second, there are nations where a small fraction of the land is economically active. The rates of rural population and of an agricultural labor force are relatively higher here, but the burden imposed by the total population on the segment active in agriculture does not seem too heavy. There is room in these areas for frontier expansion. Brazil belongs in this category.

Finally, there are areas where almost all cultivable land is being used, with less space for expansion, and where a large agricultural labor force operates and lives in the countryside. Any substantial increase in population in these areas will lead to overpopulation. Haiti is the appropriate example.

PROSPECTS

For the time being, to regard demographic pressure as an acute national issue is legitimate in only a few cases. This is not to deny that some Latin American countries may suffer imbalances between land resources and human needs. But today they do not seem to lack the physical ability to sustain a population of their present dimension. Concern over the problem is nevertheless sensible.

Is it possible that population growth will lose momentum from 1975 to the end of this century, thus lessening the mounting pressure? As the fertility rates from column 8 indicate, each Latin American nation will continue to grow, but at very different rates. At the beginning of the twenty-first century, women in Argentina, Uruguay and Puerto Rico will have two children each, if no change in the present demographic trend occurs. (The actual figure is slightly above what is needed to replace a generation.) Chile, Cuba and Costa Rica will grow moderately. On the contrary,

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³ The opposite, a large agricultural labor force compared to a smaller rural population, may be due to underregistration of the latter. This seems to be the case in Mexico. Otherwise, widespread urban unemployment should be assumed.

⁴ To a lesser degree, the areas where a labor-intensive agriculture is found are Central America and the Caribbean. The opposite, few men working per square kilometer of land, is characteristic of temperate South America, Mexico and Venezuela, where ranching prevails in many zones.

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"Across the African continent, increased attention to agriculture is absolutely essential if levels of nutrition are to be raised above their current very low levels and if the increased population is to be fed."

Food and Population in Africa

BY DONALD HEISEL

Staff Associate, The Population Council

THE GREAT Sahelian drought appears to have come to an end, after devastating a region covering all of some six countries and large regions of at least another six. The seasonal rains have returned, and the people are beginning to reestablish their crops and their herds. The Sahel has once again disappeared from the headlines. However, almost as a reminder that, in fact, the problem has not been solved, severe drought struck this spring in Somalia. The basic conditions that created the drought have not changed very much. Nor are these conditions limited to the Sahelian zone. Everywhere on the African continent, the population is growing rapidly, and food stocks are neither ample nor secure. Hard and urgent policy issues concerned with food and population confront Africa.

The total population of Africa is now probably just a little less than 400 million. Thus, the continent has about ten percent of the total population of the world, and just less than twice that of the United States. In comparison with other major developing areas of the world, Africa has a population that is moderately larger than the 325 million of Latin America but very much smaller than Asia, with its more than 2 billion.

People are distributed very unevenly throughout Africa. The average density of population for the whole continent is about 13 persons per square kilometer. That is about half the average density for the whole world, a level very similar to that of North and South America. Major zones of particularly high density are found along the coast of the Mediterranean Sea from Morocco to western Libya; in the Nile River delta and on a narrow strip along the banks of the river into the Sudan; along the Atlantic coast in a band some few hundred kilometers wide stretching from Senegal to western Cameroon; in eastern Africa in a band from the shores of Lake Victoria through the mountains of Rwanda and Burundi south to Malawi; and, finally, in about the eastern third of the Republic of South Africa. Smaller zones of high density are found near the

mouth of the Zaire River and on the Abyssinian Plateau.

The zones of higher density are not characterized by especially large urban or metropolitan populations. Africa is one of the least urbanized major areas of the world. According to recent estimates, about 25 percent of the population live in urban places. No more than 5 percent live in cities with one million or more—less than any other major region of the world. However, the urban population is growing almost 2.5 times as fast as the rural. (Of course, much of the urban growth is a result of natural increases; no more than half the urban growth is due to migration into urban places from rural areas.) Some cities are estimated to be growing at very high rates. Kinshasa, for example, has a reported rate of increase of 12 percent annually. Such a rate implies that the population will double every 6 years.

In rural areas, densities on arable land vary considerably, but in some countries densities are already high. Egypt has one of the highest ratios of population to arable land in the world. Ghana and Nigeria have ratios only 10 percent less than that of India, while Kenya already has a higher density than either India or Pakistan. On the other hand, many African countries report fewer than one person per hectare of arable land.

There are some 47 sovereign nations on the mainland of Africa. They range in population size from countries such as The Gambia, with less than half a million inhabitants, to Nigeria, the largest, with a population officially reported to be about 80 million.

MORTALITY

The size of any population changes only through the effects of mortality, fertility, and migration. Mortality levels in Africa are the highest for any major region of the world. The average crude death rate (the number of deaths per thousand people per year) for Africa is about 21. That is about 50 percent higher than the average rate for the whole world and more than twice the rate of the developed coun-

tries or of Latin America. It is about one-third higher than the level found even in Asia. The expectation of life at birth tends to be between 40 and 45 years; for every 100 children born, between 15 and 20 will die before they reach their first birthday.

There is some regional variation in levels of mortality. Death rates are generally lower in North Africa than they are south of the Sahara. Somewhat lower rates are also found in a few specific countries, including the Republic of South Africa, Ghana, and Kenya. Mortality tends to be slightly higher in West and Central Africa than in East Africa.

The available evidence suggests that mortality in Africa has been undergoing a gradual decline during recent decades. The decline has probably taken the form of a slow, steady downward movement along with a flattening of sharp peaks of mortality that would occur at times of epidemic and famine. Part of the decline results from the introduction of modern medicine. Preventive medical services have improved in recent years; some major diseases such as small pox have been virtually eliminated and others, like yaws, measles (which can be lethal in Africa), and sleeping sickness, have been brought under better control. However, many major threats to health, notably malaria, nutritional diseases such as kwashiorkor, tuberculosis and schistosomiasis, remain widespread.

It appears unlikely that the medical institutions of most countries have been a leading factor in mortality decline through the provision of curative medical services. The medical institutions in nearly all of Africa remain seriously underdeveloped. It is noteworthy that on the continent, only Egypt, Tunisia, and the Republic of South Africa have ratios of doctors to population equal to or better than that of Bangladesh. Typically, countries have 10 thousand or more persons per doctor—but the numbers go as high as 90 thousand to 1 in some countries—as compared with 5 thousand to 1 in countries like Bangladesh, India and Pakistan.

General socioeconomic and material progress has made an important contribution to improved mortality. Pipeborne water, improved all-weather roads, better housing, and a general increase in public information about how to deal with health problems have all contributed to better health. For example, a fairly simple change like the replacement of thatch with corrugated metal roofs helps reduce the problem of vermin in houses and makes possible the collection of comparatively clean rain water for washing as well as for consumption.

The most plausible future course of mortality appears to be a continuing gradual decline. Programs of public health and preventive medicine will presumably be expanded. There is a continuing growth in the number of medical schools, which will eventually help reduce the shortage of trained per-

sonnel. Finally, continuing social and economic development will undoubtedly help in the further reduction of mortality.

FERTILITY

African fertility shares with mortality the characteristic of being the highest in the world for any major region. Crude birth rates (the average number of births per thousand people per year) are typically around 50. By contrast, in both Latin America and Asia, birth rates are on the average below 45.

There are notable areas of lower fertility in Africa. In North Africa, Egypt and Tunisia have birth rates now reported in the high 30's. A region of lower fertility is found centered around Gabon, Equatorial Guinea, and parts of Cameroon, the Congo, and Zaire. In general, fertility tends to be higher in the belt stretching from Senegal to Nigeria and throughout much of East Africa.

In sub-Saharan Africa, differences in fertility appear to be related to variations in the levels of health, with venereal disease playing an imprecisely known but possibly important role in reducing fertility. Other very important factors include variations in the average age at marriage, marital stability, adherence to a traditional postpartum taboo, and the average age of weaning. There is no evidence to indicate that any family planning programs have had a measurable impact on national levels of fertility. Throughout sub-Saharan Africa, the number of individuals practicing contraception remains demographically negligible.

The lower fertility found in Egypt and Tunisia cannot be explained entirely as a result of the activities of those country's family planning programs, but the use of contraception by significant proportions of the population is unquestionably an important factor. Other contributing factors include a rising age at marriage, changing age distribution, and, probably, increased use of induced abortion.

In the absence of effective program intervention, it is possible that there will be a slight rise in fertility in the near future. There is evidence that such a rise has taken place in recent years in a number of countries, especially south of the Sahara. Greater control over malaria and venereal disease, reduction of the traditional period of postpartum taboo and a trend away from breast feeding would tend to increase fertility. Of course, if social and economic development continues, fertility would presumably eventually decline.

Sufficiently vigorous governmental activities could probably hasten this decline. However, a substantial increase in such programs does not appear highly likely just now. One important impediment is the weakness of medical institutions. To the extent that

any family planning program depends upon trained medical personnel for the organization and delivery of services, progress will be slow in Africa. More generally, governments in Africa are confronted with an appalling swarm of political, economic and social crises. A government threatened with unemployment, inflation, and prospects of coup and secession is unlikely to give full attention to difficult, expensive and long-run solutions to basic problems.

Moreover, not all of the governments in Africa are by any means convinced that they should reduce the fertility level of their populations. Indeed, there is a growing skepticism in many African countries about the appropriateness of population control, and about the motives of those who advocate it. It is charged that the proponents of slowing the rate of population growth through fertility control are, in fact, interested in prolonging the existing economic dependency and political inferiority of Africa. Such a view is by no means universal in Africa, but is probably more common there than in Asia, for example.

Only six African states have established government programs to provide family planning counseling and services. They are Morocco, Tunisia, Egypt, Ghana, Kenya and Botswana. Together they comprise about 20 percent of the total population of Africa. In a number of other countries, including Liberia, Nigeria, Tanzania and Zaire, family planning services and guidance by private or local agencies are permitted and in some cases encouraged. In general, however, the private programs have had even less success than the very limited efforts of the governments. In many countries, family planning is tacitly discouraged; in a few states, it is actively discouraged. Among the latter are Malawi, Gabon and Cameroon.

The extent to which contraception would be acceptable if made very widely available to the populations of Africa is a matter of some speculation. Research indicates that there are no rigid cultural or moral taboos against the use of contraceptives, although most people report that they would like to have large families, especially in sub-Saharan Africa. Sterility and child mortality are feared. Since children are the chief means of support in old age, the fears are completely understandable. There is also anxiety about the effects of available contraceptives on the established roles of men and women within the family. Some fear that wider availability of contraceptives might encourage promiscuity. Most important, there is very widespread ignorance or misinformation about the existence of the methods of fertility control available to most people in the developed countries.

In general, then, there is slim basis for any realistic expectation of a marked decline in fertility in the near future, especially in sub-Saharan Africa.

If fertility and mortality continue in the most likely course during the years to come, the rate of population growth will, of course, remain high and will probably even rise somewhat. There are now about 20 million births and 8.5 million deaths each year. Thus, Africa is increasing by 11.5 million persons annually. The rate of increase is close to 3 percent per year; the population may be expected to double before the end of this century.

An additional important consequence of the high rate of growth and the high level of fertility is the youthful average age of people in Africa. About 45 percent of the population is under age 15 in most countries. This imposes a heavy burden of dependency; children are consumers although they produce very little. Furthermore, the large proportion of children means that population growth in Africa has considerable momentum. The parents of the coming decades are already born and are very numerous. Thus, even if fertility rates begin to decline, the numbers of births will remain high. Of course, the large number of children in the population also means that demands for places in schools, and for jobs, will continue to increase for at least a decade even if fertility begins to drop.

MIGRATION

The most important migration stream in Africa is the movement from rural areas and villages to the growing urban centers. Each year, the rural population of Africa increases by about 6 million people. At the same time, a net stream of migrants equivalent in size to about 40 percent of that increase moves from rural to urban areas.

It is important to recognize that migration from rural to urban areas does not simply and directly lead to the dissolution of traditional village life. It has been a long established pattern in Africa for adult males to leave their village periodically—usually for a single season—to earn money and goods. The practice has been incorporated into village life and in many ways reinforces the traditional society. A striking example of the importance of seasonal migration as a means of support for traditional society is found in the report of the experience of one Sahelian village during the drought years. In 1969–1970, 35 percent of the men 15 to 44 years of age left the village to find work during the dry season. As the drought progressed, the percentage rose steadily, until during the dry season of 1973–1974, 75 percent of the village men migrated. Their migration was a significant part of their attempt to assure the survival of the village.

In contemporary Africa, periodic migration into urban centers continues, although the length of stay away from the village has increased, and the movement is no longer one of males only. Many urbanites

of modern Africa maintain close personal ties with their natal village. They visit frequently, remit money to relatives who have stayed behind, and expect to return to the village for retirement and eventual burial there.

However, the fact that rural-to-urban migration does not compel a complete break with traditional society does not imply that it is a smooth and easy process or that it has no disruptive effects. The urban-ward flow continues, despite the high rates of unemployment and the very low wages of casual employment in informal occupations in the towns. The migrant's hopes for improved economic prospects in an urban area reflect the limited opportunities and economic insecurity he sees in village life.

Rapid urban growth is already a real concern for many governments. They fear that increased urban concentration, in the absence of an equivalent expansion of jobs and facilities, will lead to political and social instability. Indeed, while migration to a town is beneficial to the individual and possibly to the immediate family, it is possible that neither the sending nor the receiving areas benefit.

Although some countries may have had limited success in slowing the rate of rural-to-urban migration, none has been able to control it fully. The net flow of migrants into towns appears likely to continue and possibly to increase.

Thus, the demographic situation in Africa poses three challenges. First, the population is growing at a very rapid rate, with some likelihood that the rate will go even higher. Behind the high rate of growth there is also a strong momentum resulting from the very high proportion of children in the population. Second, rural densities in many areas are already high. Third, the rate of rural-to-urban migration is moderately high with a strong potential for increase. The consumption, production, and distribution of food are related to these demographic conditions.

FOOD CONSUMPTION

Broadly speaking, Africa is divided into three major dietary regions. In North Africa, wheat is the major source of calories, with corn, barley, rice, dates and figs as important supplements. Beef, mutton and pulses are the leading sources of protein. The second major region begins south of the Sahara, stretches across the continent from the Atlantic coast up to the Abyssinian highlands and the mountains of Rwanda and Burundi, and goes south into Angola and Zambia. Here millet and sorghum are primary calorie sources, supplemented by corn, rice, bananas and, especially, yams and cassava. Protein comes chiefly from pulses and, in some areas, from peanuts. Very little meat or milk is included in the diet. The third major region covers eastern and southern Africa. Corn is the most important source of calories, followed by

sorghum and millet, rice, and teff (in Ethiopia). Protein is obtained from pulses and from somewhat more meat and dairy products than in the second zone.

On the average, food consumption in Africa appears to fall below minimum nutritional requirements. According to estimates recently reported by the Food and Agricultural Organization (FOA), the average daily supply of kilocalories per person for the whole continent was 2,160. That was judged to provide about 92 percent of the requirement; the largest gap between the needed and the available supply of calories of any major region of the world. Kilocalories per capita available in Africa equal about two-thirds the per capita supply available to the countries of the developed world.

There is considerable variation between countries in the estimated available energy supply. In 5 countries, the daily per capita kilocalorie supply in 1970 (the most recent year for which data was available) fell below 2,000; the percentage of daily requirements met in those countries was in every case less than 85. The countries were Algeria, Angola, Somalia, Tanzania and Upper Volta.

These estimates indicate that for a very substantial number of people in Africa there is a significant shortfall in energy intake. This deficiency is particularly serious because the utilization of protein is also impaired, since under these conditions protein is used as a source of energy. At the same time, the data indicate that the supply of protein is itself severely limited in Africa. The average daily per capita supply is estimated to be about 56 grams. In the developed countries, the comparable figure is about 94 grams. In over one-fifth of the countries of Africa, the protein supply is equivalent to less than 50 grams per person per day.

There is an obvious need to not only maintain but to improve levels of consumption in Africa; indeed, through the 1960's and into the 1970's, the total supply of cereal grains increased by some 42 percent. However, the increase was due more to greater imports from other regions of the world than to rising production in Africa. While the production of cereals increased by about one-third, imports rose by a factor of nearly two and one-half. Thus, by the early 1970's, Africa was spending on the order of \$350 million per year to import food grains. Total food production during the 1960's and the early 1970's was estimated to have barely kept up with population increase for the continent as a whole. In

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"If we temper demand and at the same time increase the supply of food, in the year 2100 the world's peoples will certainly have enough to eat."

World Population and Food Needs Tomorrow

BY THOMAS E. DOW, JR.

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WHETHER WE HAVE enough to eat in the years ahead has to do with both the supply of food that will be available and the demands that will be made upon it. Demand is determined by the number of people who must be fed and by the level of their consumption.

Although it is not possible to make accurate demographic predictions about future patterns of population growth or fertility, it is clear that the population is increasing. Specifically, a history of high fertility and declining mortality, particularly in Asia, Africa, and Latin America, has created current populations in which the younger members greatly outnumber their parents. Consequently, "in a generation, the number of potential parents will inevitably be much larger than at present."¹ The effect of this growth momentum can be seen most clearly if one assumes that all parents will immediately achieve replacement level fertility—that is, an average family size of two children reaching maturity.

Although such a level of fertility—with each couple only replacing itself in the next generation—would stop population growth, it would not do so before the year 2050. By that time, however, world population would increase from approximately 3.6 billion in 1970 to 5.5 billion in 2050. In regional terms, the populations of the developing and developed world would increase by 63 percent and 27 percent, respectively. This difference in growth rates suggests that the "momentum of future population growth is currently about two-and-one-half times greater in the developing countries than in the developed ones."² Overall, then, even if the brakes of population control were applied immediately, limiting each family to an average of two children, the momentum or speed built into the age distribution of the

world's population would still result in the addition of at least 1.5 billion more people.

One should add that this increase is based on the totally unrealistic assumption of immediate replacement fertility. If, instead, one recognizes that a transition to such limited fertility will take years to accomplish—if it is accomplished at all—one can then calculate the demographic consequences of such a delay. As Table 1 suggests, total and regional population in the year 2050 will be very much larger if replacement fertility is reached later rather than sooner.

Table 1: Future Population Estimates

Area	Population 1970 (in billions)	Population size in 2050 if replacement fertility is reached in		
		1980	2000	2040
Developed areas	1.1	1.5	1.6	1.8
Developing areas	2.5	4.7	6.5	11.6
World	3.6	6.2	8.1	13.4

Source: Berelson, *op. cit.*, p. 12.

Alternatively, if no change in current fertility is assumed, world population will increase from approximately 4 billion in 1975 to 34 billion by the year 2070. Thus, as Berelson suggests, "population growth is inevitable for most countries and for the world as a whole. The question is whether by historical standards population growth will be very fast or only moderately fast."³

It remains to ask whether, in terms of human welfare and values, it matters which growth pattern we follow. Today, one extreme position "holds population growth to be positively desirable [and] finds the current world population well short of any limits that would be disadvantageous"; while the opposite extreme position "sees current population growth as a genuine crisis, predicts famine in the short run in the absence of immediate and drastic decreases in rates of growth, and attributes poverty, malnutrition, deterioration of the environment, and even threats of war to population growth."⁴ Between these extreme

¹ Bernard Berelson, "World Population: Status Report 1974," *Reports on Population/Family Planning* (New York: The Population Council, January, 1974), p. 9.

² *Ibid.*, pp. 11–12.

³ *Ibid.*, p. 16.

⁴ *Ibid.*, p. 17.

positions is the view that rapid population growth is a "serious intensifier and multiplier of many other social and economic problems . . . and . . . that prudence and responsibility with regard to later generations require a dampening of . . . present growth rates."⁵ As we shall see, this position is well illustrated in the area of food.

FERTILITY CONTROL PROSPECTS

Assuming that some dampening in the global rate of population growth would be desirable, it remains to analyze the prospects for such a reduction. Once again, there are very different perspectives. "On the one side is the position that fertility will not decline to any appreciable degree without major changes in the social setting"; on the other side is the position that properly administered family planning programs "can make a substantial difference in hastening the process of fertility decline by providing modern [contraceptive] means to the . . . people ready for such measures and by encouraging the ambivalent. This may not be enough in itself . . . but it is doable, needed in any case . . . whatever the motive power, good in its own right on grounds of health and justice, . . . and economic both in itself and as compared to the costs of social change, which proceeds as it can in any case."⁶ In support of this position, one should note that reasonably rapid fertility declines in South Korea, Taiwan, Hong Kong, Singapore, Mauritius, Sri Lanka and West Malaysia have apparently been due in some measure to family planning programs. In other cases, e.g., India, Pakistan, Bangladesh, Ghana and Kenya, the record is less clear.

On balance, then, we have rapid population growth in the developing world and do not know how or when this growth will be stopped. Clearly, this growth cannot be independent of the food necessary to sustain it. In this sense, population growth will be limited by the availability of food. However, there is no agreement on how much food is available.

FOOD PRODUCTION: DIFFERENT PERSPECTIVES ON THE LIMITS TO GROWTH

Some experts are convinced that our potential for increasing the supply of food at a reasonable cost is sharply limited. They point out that the best arable land is already under cultivation, and that the costs of developing new land will be very high. Moreover, they argue that such costs will continue to increase as

the proportion of arable land remaining decreases. In this view, "most of the economically feasible opportunities for bringing new land under the plow already have been exhausted. . . ." Consequently, with the exception of regions in sub-Saharan Africa and Brazil, the cost of bringing new land under cultivation is held to be uneconomic.

This, of course, still leaves the possibility of increasing the output in "old" land. In this connection, however, these experts emphasize that although it is possible to increase further the productivity of land already under cultivation, the law of diminishing returns will tend to force the cost of such gains beyond a supportable level.

Thus, "even if the choice were consistently to produce food as the first priority . . . continued population growth and the law of increasing cost [diminishing returns] could rapidly drive the system to the point where all available resources were devoted to producing food, leaving no further possibility of expansion."⁸ In short, the system would collapse—sooner, as Donella Meadows points out, if assumptions about improved yields are conservative; later, if they are more liberal. But even in the latter case, the demand for food would exceed the supply before the year 2100.

Other experts believe that this assumption is pessimistic, and that "by making more optimistic but . . . equally plausible assumptions . . . , any physical limits to agricultural production [tend to] recede beyond the [year 2100]."⁹ Specifically, Meadows assumes that development costs for bringing new land under cultivation will tend to increase as arable land is used up: the most attractive land is used first; consequently, as the fraction of potentially arable land remaining decreases, the development cost per unit of land increases steeply.

In the opinion of the Science Policy Research Unit of the University of Sussex, however, this conclusion is actually based on the assumption "that agricultural investment decisions will continue to be made by national entities, each of which will be investing in agriculture mainly within its own national boundaries."¹⁰ As the demand for food grows, investments will be made by national entities in areas with low as well as high fractions of arable land remaining. But if one uses a global, rather than a national, framework, "one would start by investing in the regions of the world with the lowest development costs"¹¹; that is, in regions with the greatest fraction of potentially arable land. If this were done, significant further gains might be made before the cost of developing new land became prohibitive.

The Sussex group is also critical of the assumption that an increase in the production of food on currently cultivated land will require a greater increment of investment. In its view, "this assumption of diminishing returns to agricultural investment . . . has not

⁵ *Ibid.*, p. 19.

⁶ *Ibid.*, p. 31.

⁷ Lester R. Brown, *By Bread Alone* (New York: Praeger, 1974), p. 75.

⁸ Donella H. Meadows, et al., *The Limits to Growth* (New York: Universe Books, 1972), p. 53.

⁹ H. S. D. Cole et al., *Models of Doom: A Critique of the Limits to Growth* (New York: Universe Books, 1973), p. 56.

¹⁰ *Ibid.*, p. 60.

¹¹ *Ibid.*, p. 60.

been confirmed by historical experience."¹² As for the future, the group suggests that if technical progress and a global investment strategy are assumed, land yields will continue to equal or exceed additional investments.

In general, then, the Sussex group feels that physical limits to further increases in food production are not likely to be significant over the next century. In its own words, if "one assumes continuing technical progress in land development techniques and in plant varieties, as well as the rational use of agricultural resources on a world scale, then . . . any physical limits to agricultural production recede beyond [2100]."¹³

At the same time, the group recognizes that non-physical difficulties exist (primarily in the political sector). Present and prospective food problems are explained by reference to these difficulties, including those political, social, and economic considerations that prevent the most rational use of agricultural resources on a global scale. The group holds that it is these man-made obstacles that prevent the optimum use of scarce land, water, energy and fertilizer, and the rational distribution of available food. To be sure, these are not simple problems—the political uses of food and oil by the United States and the Organization of Petroleum Exporting Countries (OPEC) alone suggest the seriousness and complexity of the matter—yet neither are they beyond the realm of human intervention.

At the moment, however, whether one stresses physical or political factors or some combination of the two, it is clear that millions of the world's people face serious food problems. For a variety of reasons, including the high cost of food, energy, and fertilizer, as many as 900 million people may now be victims of malnutrition. In 1974, large-scale malnutrition deaths were reported for the Indian states of Assam, West Bengal, Bihar, and Orissa, and for the Sahel region of West Africa.¹⁴

In the light of these difficulties, as well as those to be anticipated as food demand eventually forces us "farther and farther up the cost curve in order to bring ever more marginal resources into use,"¹⁵ Lester Brown has proposed that we reduce birth rates; that we simplify diets among the more affluent, to reduce,

¹² *Ibid.*, p. 58.

¹³ *Ibid.*, p. 64.

¹⁴ See Thomas E. Dow, Jr., "Drought and Development in the Sahel," *Current History*, vol. 68, no. 405 (May, 1975), pp. 197–201.

¹⁵ Brown, *op. cit.*, p. 12.

¹⁶ In Asia, Africa, and Latin America, per capita availability of grain is only 400 pounds per year. Almost all this is consumed directly. In North America, per capita grain availability is 2,000 pounds, of which 200 pounds is consumed directly and the rest is consumed indirectly in the form of meat, milk and eggs.

¹⁷ Brown, *op. cit.*, pp. 13–14.

¹⁸ *The New York Times*, March 16, 1975, p. 28.

¹⁹ *The New York Times*, March 19, 1975, p. 1.

not their nutritional value, but their wasteful per capita claim on the earth's scarce agricultural resources;¹⁶ and that we concentrate agricultural investments in low-yield areas where inputs of fertilizer and energy will show the greatest return.¹⁷ It should be remembered that vigorous development programs including family planning have apparently contributed to significant reductions in fertility in some developing nations.

Beyond this, our response to food scarcity may be evaluated on the basis of their short-term or long-term intentions. In the former case, the food surplus nations—primarily the United States—have responded to food shortages on a crisis-by-crisis basis. Although this ad hoc procedure has tended generally to prevent conventional famines, current reductions in American grain reserves and concessional food sales and grants under Public Law 480 suggest that a more systematic long-term approach is necessary.

In one sense, the basis for this approach was established at the recent World Food Conference in Rome and by the independent but complementary actions of the World Bank. Specifically, the most important recommendations of the Rome conference include a World Food Council to oversee international activities aimed at improving the food situation, a consultative group to coordinate investments in agricultural development, an early warning system to detect impending famines, and a world food reserve to be distributed in time of need. Since the conference, substantial progress has been made toward establishing the council and the consultative group, but the proposals for an early warning system and food reserves have lagged.¹⁸ The problem is partly political: not all nations are willing to provide up-to-date information on weather, crop forecasts and production figures. With regard to food reserves, the problem is largely economic: the United States is unwilling to bear the expense of building grain reserves large enough to ensure world food security.

Meanwhile, the World Bank plans to double its investment to \$1 billion a year by 1979 to help the poorest people in rural areas to increase their agricultural productivity by five percent a year.¹⁹

One is left with the impression that neither abundance optimists, who minimize the implications of increasing demand, nor famine pessimists, who minimize the possibility of increasing supply, are likely to be accurate prophets. If we temper demand and, at the same time, increase the food supply, in the year 2100 the world's peoples will have enough to eat. ■

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"For the first time in the history of mankind, the eradication of hunger and malnutrition has become a practical possibility." Consequently, "... the governments of the developing countries [must] redirect their domestic priorities toward the rural sector, whose backwardness, in many cases, has become the major constraint on their general economic development."

The World Food Problem: Possibilities of International Action

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THE SHORTAGES and violent price fluctuations of agricultural commodities in the past three years, after a long period of ample supplies and stable prices, took the world by surprise. The first reaction was a wave of alarm about future food supplies. Have we reached the point where population growth and rising affluence are beginning to outrun the world's capacity to produce food? Are we running out of land, water, energy? Have we reached the limits of agricultural technology? Is our climate changing? In short, are we witnessing a historical turning point in mankind's long, and thus far generally successful, struggle for better and cheaper food?¹

In support of a more optimistic long-term outlook, some specialists pointed to the gradual improvement of per capita food supplies over the last quarter century and to the vast opportunities for increasing agricultural production, particularly in the developing countries.² In this view, recent crop failures in major grain-growing areas and the lack of adequate reserves to meet these contingencies largely explain the shortages and high prices experienced in the past three years.

The worldwide debate touched off by these events has been useful in throwing new light on some old problems: the problem of food security, the problem of chronic undernourishment in the poor countries,

the problem of agricultural development, and the population problem.

Food Security. Agriculture, more than any other economic activity, remains subject to the vagaries of weather. The recent series of poor crops in the U.S.S.R., in South Asia and in the United States, which was responsible for the severe depletion of world grain stocks after 1972, was unusual but not unprecedented. Some of us remember the devastating droughts that swept the Great Plains of North America in the mid-1930's. Several drought years in the U.S.S.R. and in India followed each other in rapid succession in the mid-1960's; but North American surplus stocks were adequate to cover these shortfalls without significant price increases. What made the difference this time was the policy to restrict production, which left the United States and Canada with insufficient stocks to meet the contingencies that arose between 1972 and 1974.³

Throughout the course of history, man has tried to protect himself against crop failures. Steady improvements in agricultural techniques, the diversification of food production and the development of trade have reduced the proportions of the problem over the centuries. A crop failure, nonetheless, remains a serious matter for many developing countries, whose food supplies are inadequate even in normal years. In these circumstances, a failure of the monsoon or devastating floods may still cause thousands of deaths, particularly among children and old people. Moreover, many of the developing countries have come to depend on substantial grain imports, primarily from North America: in 1975, for example, India is likely to import over 7 million tons at a cost of over \$1 billion.

The developing countries are generally not in a position to finance adequate grain reserves so that they can ride out domestic crop failures let alone worldwide shortages; nor can they reduce grain consumption, because they use all the grain they can grow and

¹ Lester R. Brown, *By Bread Alone* (New York: Praeger, 1974).

² United Nations Food and Agriculture Organization (FAO), *Assessment of the World Food Situation, Present and Future* (Rome, 1974); United States Department of Agriculture, *The World Food Situation and Prospects to 1985*, Foreign Agricultural Economic Report, no. 98 (Washington, D.C., 1974); and H. Walters, *The World Food Situation*, National Agricultural Outlook Conference, December, 1974 (reprinted in United States Senate, Committee on Agriculture and Forestry, *1975 US Agricultural Outlook*, December 23, 1974).

³ Fred H. Sanderson, "The Great Food Fumble," *Science*, May 9, 1975.

import for direct human consumption, at average dietary levels scarcely above minimum nutritional requirements. The poor countries thus have a vital stake in more stable world grain supplies and prices.

The events of the past few years have shown that crop failures can also cause serious economic and social problems in the affluent countries. True, these countries are infinitely better off because they produce several times the amount of grain that would be required to feed their people on a vegetarian diet. The grain diverted to livestock feeding, in effect, constitutes a reserve against adversities. In the event of a crop shortfall, the affluent countries can draw on this reserve in two ways: by reducing the quantity of grain fed to livestock, and by increasing livestock slaughter rates. Even a severe crop shortfall such as that experienced by the United States in 1974 thus involves little real hardship for Americans. The impact on our more-than-adequate levels of nutrition is insignificant; in fact, a moderate reduction in the consumption of meat and dairy products is likely to have a favorable effect on public health.

Grain shortages are, nevertheless, a matter of concern, even in the affluent countries because of their inflationary impact. Since grains are the principal raw materials for food production, grain prices are a major factor in determining food prices and the cost of living. Thus, a cutback in the amounts of grain fed to dairy cattle, beef cattle, hogs and poultry reduces the supply and raises the prices of dairy products, eggs, and meat. Increased slaughter may provide temporary relief in making meat more plentiful but, in the longer run, it will aggravate the shortage once the excess livestock has been marketed.

The inflationary impact of temporary shortages of grain and other crop products is more serious because 1) the demand for food is relatively inelastic (that is, consumers do not cut down readily on their favorite foods when food prices rise); 2) supply responses to high prices are slow because of the time required to bring new acreage into production and to rebuild livestock herds; 3) the inflationary effects of increased farm prices on retail food prices and on the general price level tend to be largely irreversible, because of the downward rigidity of the wage and price structure in the nonagricultural sectors.⁴

Another consequence of temporary shortages and high prices of grains is their disruptive effect on international trade. Countries that are food exporters,

like the United States, can ease their own problems by restricting exports. In effect, the problem is shifted to the importing countries. In doing so, the United States is not only setting a bad example for other food and raw-material exporting countries, it is also damaging its own long-term export interests. There already are indications that the United States embargo on soybean exports in 1973 and the limited export controls on grains in 1974 provided new ammunition to the advocates of greater self-sufficiency in Europe and Japan. A grain stabilization reserve would help resist domestic pressures for export controls.

Chronic Undernourishment. Despite the gradual improvement in per capita food production, large areas of the world—particularly the densely populated countries of South Asia—still produce barely enough food to meet their minimum nutritional requirements. Nutritional surveys indicate that about 400 million people actually live below the minimum standard of about 2,000 calories that is necessary to sustain life at a moderate level of activity.⁵ Mass migration to the cities seems to have aggravated the distribution problem.

Malnutrition is a matter of concern not only for humanitarian reasons. There is ample evidence that in many developing countries dietary deficiency is a major depressant of human productivity and vitality. Malnutrition diminishes a child's motivation and ability to learn. It affects the coordination, speed, stamina and general health of children as well as adults. At the low levels of nutrition experienced in many developing countries, even small improvements in the food supply can therefore make a greater contribution to economic development than any other investment.⁶

Agricultural Development. Contrary to a widespread impression, agriculture has not been stagnating in the developing countries. In fact, the production of grain—the mainstay of their diet—has been rising by an average of about three percent a year—about as fast as in the developed world. But because of rapid population growth in these countries (2.5 percent), it is not rising fast enough to permit a significant improvement in levels of nutrition.

Can the growth of agricultural production be speeded up? In developing countries, there is apparently ample room for increasing crop yields, which average between one-fourth and one-half of those achieved in the developed world. Fertilizer use is only one-fifth of that in the United States, and about one-tenth of that in West Europe. Water use is generally inefficient; cultivating practices are backward. Most developing countries are blessed with a warm climate that favors an increase in multiple cropping.

The problem is how to overcome human lethargy and the formidable technical, economic and institu-

⁴ Dale E. Hathaway, *Food Prices and Inflation*, Brookings Papers on Economic Activity, no. 1 (Washington, D.C.: Brookings Institution, 1974); John A. Schnittker, *The 1972-73 Food Price Spiral*, no. 2, Brookings, 1973.

⁵ FAO, *Assessment of the World Food Situation*, chapter 3.

⁶ Alan Berg, *The Nutrition Factor*, Brookings, 1973; President's Science Advisory Committee, *The World Food Problem*, vol. 2, chapter 1 (Washington, D.C.: U.S. Government Printing Office, May, 1967).

tional obstacles to more rapid agricultural development. Greater national efforts, including more effective research and educational services, and price, production, credit and investment policies that favor rather than discriminate against the agricultural sector are required. Much greater international assistance for agricultural research and development, including investments in fertilizer and pesticide production, improved water supplies and storage facilities are also needed.

Population. It is often pointed out that the per capita food supply in many developing countries could be improved much more rapidly if population growth were slowed from the present rate of about 2.5 percent to, say, one percent (the average rate in the developed countries). In affluent countries, it has become fashionable to blame the food problem almost entirely on the failure of the developing countries to take more vigorous action to reduce population growth. But before one becomes too impatient with the apparent failure of these countries to slow down the rate of population growth, he should realize that it takes time for family planning practices to adjust to new demographic, economic and social realities.

Advances in public health and the resulting decline in mortality rates have been the main factor in the acceleration of population growth in the developing countries. It takes time before the realization of the increased chances of the survival of children is reflected in family planning decisions. As economic conditions change with increasing urbanization and the commercialization of agriculture, the economic advantages of smaller families will become apparent, but here again, it takes time for the evidence to sink in.⁷ Finally, because of the high proportion of young people in the population of developing countries, several decades may elapse before any decline in fertility rates is reflected in a corresponding decline in rates of population growth.

Thus the World Bank's projection of India's popu-

lation to the year 2000, based on an assumed "fast" decline in fertility, still estimates a population of 957 million, a 75 percent increase over 1971. This may be compared with a projected population of 1,109 million, based on a "moderate" decline in fertility—a 100 percent increase over 1971.⁸ The 25 percent difference in projected population is indicative of the rather modest contribution to per capita food availabilities that can be expected to result in this century from the declines in fertility rates that can realistically be anticipated. This does not mean that efforts on the population front are less important or less urgent than action on food production; but it does mean that even if progress on family planning is made in the next decade, its benefits will come mainly in the next century.

RECOMMENDATIONS OF THE WORLD FOOD CONFERENCE

Responding to a United States initiative in the United Nations General Assembly,⁹ a World Food Conference was convened in Rome in November, 1974, to draw up a global plan to solve immediate and long-term problems of world food supply. The World Food Conference addressed what its Secretary General, Sayed Marei, called the "three pillars" of world food policy: to provide a better system of world food security; to deal with the problem of chronic undernourishment; and to increase food production in the developing world.¹⁰ It did not deal with the population problem, which had been the subject of another United Nations Conference on world population held in Bucharest in August, 1974.¹¹

The principal immediate result of the World Food Conference was the establishment of a negotiating framework for international action in the three major substantive areas of food policy. A World Food Council was set up to coordinate the activities of international agencies and national governments with regard to food reserves, food aid, agricultural production and investment, and related matters. It will consist of 36 member countries representative of the various regions of the world. The council will be serviced by a secretariat at the Food and Agriculture Organization (FAO) headquarters in Rome.

The World Food Conference endorsed the establishment of a coordinated system of nationally held cereals reserves but left the details and the structure to be worked out in subsequent negotiations. The conference also approved a commitment to provide food aid to a minimum level of 10 million tons of cereals each year plus certain other food commodities. The conference endorsed a proposal sponsored, *inter alia*, by a number of oil-exporting countries to establish an International Fund for Agricultural Development.

To deal with the critical problem of fertilizer supplies, the conference called upon participating coun-

⁷ IBRD, *Population Policies and Economic Development*, Staff Report (Baltimore: Johns Hopkins University Press, 1974); United Nations Department of Economic and Social Affairs, *The Determinants and Consequences of Population Trends* (New York, 1973).

⁸ International Bank for Reconstruction and Development, *Population Projection for Member Countries*, 1974.

⁹ Secretary of State Kissinger's Address, September, 1973. State Department Bulletin, October 15, 1973.

¹⁰ The conference generally endorsed the strategy proposed in the working document prepared by its Secretariat, titled *The World Food Problem: Proposals for National and International Action* (Rome, 1974).

¹¹ U.N. *World Population Conference Held at Bucharest*. U.S. Statements and Text of World Population Plan of Action, State Department Bulletin, September 30, 1974; Philander P. Claxton, *The World Population Conference: An Assessment*, State Department Bulletin, November 11, 1974. The remainder of this article will deal only with the food policy issues.

tries to provide financial and material support, through bilateral assistance and through the International Fertilizer Supply Scheme launched by the FAO Council in July, 1974. Assistance would include the financing of fertilizer imports as well as loans and technical assistance to developing countries for the construction and improvement of fertilizer production facilities.

The World Food Council will be assisted by a number of functional bodies, like the Committee on World Food Security (to be established under the FAO Council), the Committee on Food Aid Policy and Programs (the World Food Program's 'Inter-governmental Committee under a new name), the existing Consultative Group on International Agricultural Research (headquartered in the International Bank for Reconstruction and Development, [IBRD]) and its Technical Advisory Committee (in Rome), and a new Consultative Group on Food Production and Investment in Developing Countries (headquartered in the IBRD), charged with encouraging an increased flow and a more effective use of resources for these purposes, and with coordinating the activities of national governments and international organizations (IBRD, United Nations Development Program [UNDP], FAO) operating in this field.

The conference also passed a number of resolutions, asserting the basic right of "every man, woman and child to be free from hunger and malnutrition" and endorsing the goal that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition.¹²

United Nations conferences are known for their preoccupation with rhetoric, resolutions and reorganizations. The World Food Conference was no exception. Yet it is too early to write it off as another exercise in futility. The "proof of the pudding" will be in the follow-up.

There are some encouraging signs. A major reason for calling a conference with the widest possible participation was to enlist the interest of countries that had not contributed to similar efforts in the past, in particular, the Communist countries and the newly affluent petroleum exporters. Countries in the latter

group, at least, showed some interest, as noted earlier, by cosponsoring the proposal for an International Fund for Agricultural Development.

Another plus is the fact that the major international organizations that will share the operational responsibility for following up on the resolutions of the conference have apparently avoided the jurisdictional squabbles that could easily undermine the effort. This cooperation should be facilitated by the appointment to key coordinating positions of such experienced and persuasive officials as John A. Hannah (former administrator of the United States Agency for International Development), Sartaj Aziz (director of FAO's Commodity and Trade Division), and Edwin Martin (former chairman of the [OECD] Development Assistance Committee).

Nonetheless, by and large, the follow-up on the World Food Conference has not gone beyond the discussion of organization, staffing and procedures. Little progress has as yet been made on the substance of the negotiations that lie ahead. Much work remains to be done to sort out the policy issues, and possible solutions, in the search for greater stability, equity, and productivity.

POLICY ISSUES AT THE CONFERENCE

The Search for Stability of Supplies and Prices. The idea of a buffer stock of grain goes back to the Old Testament. The droughts of the 1930's that inspired United States Secretary of Agriculture Henry A. Wallace's proposal for an "ever-normal granary," led to United States legislation in 1938 to provide for the storage of surpluses to meet crop shortfalls or other emergencies. Postwar food shortages prompted Sir John Orr, the first director general of FAO, to propose a plan for the purchase and storage of international reserves of food commodities that could be used to stabilize prices and to relieve hunger and malnutrition. A later FAO proposal, for a "World Emergency Food Reserve," focused on famine relief only.¹³

Interest in international food reserves waned as huge grain stocks accumulated in the United States in the 1950's and 1960's, as a result of overproduction stimulated by price supports. These stocks, financed by the American taxpayer, proved more than adequate to meet crop shortfalls abroad, including the series of crop failures in the U.S.S.R. and in India in 1963-1967. But in 1973, the director general of FAO revived the issue¹⁴ in the light of the depletion of North American grain stocks and the declared intention of the United States not to build up government stockpiles again.

International reaction to the new situation has been marked by confusion and equivocation. Not surprisingly, most importing countries would prefer a return to the situation prevailing in the 1950's and 1960's when the United States—with the cooperation

¹² *New Coordinating Council Proposed for World Food Conference Follow-Up*, FAO press release, November 18, 1974; *World Food Conference Meets at Rome*, State Department Bulletin, December 16, 1974; United States House of Representatives, Committee on Foreign Affairs, *Report on the World Food Conference*, Hearing, November 26, 1974.

¹³ For a brief survey of past and current proposals, see United States House of Representatives, Committee on Foreign Affairs, Subcommittee on International Organizations, *International Food Reserves*, October, 1974. See also, FAO, *Functions of a World Food Reserve* (Rome, 1956).

¹⁴ *World Food Security: Proposal of the Director General of FAO*, August, 1973.

of Canada—assumed the responsibility for the maintenance of an adequate world grain reserve. The developing countries are interested in holding emergency reserves—provided these are financed by international assistance. In the United States, the secretary of agriculture, who seems to be calling the shots on this issue, continues to be adamantly opposed to any government stabilization program. In his view, market forces should be given free rein. If importing countries are concerned about their future access to supplies at reasonably stable prices, let them build up their own stocks, or enter into long-term contracts.

The United States has indicated that it is prepared to participate in an international arrangement to coordinate national stockpile policies but it is not clear whether this implies any commitment other than a willingness to take part in consultations that do not commit any government to any specific course of action. For example, will the United States—and other participants—commit themselves to carry reserve stocks of a specified size? What measures will they take to make sure stocks are there when needed? When will stocks be built up and under what circumstances will they be released?

Rather precise guidelines on these points are needed for any workable stockpiling agreement. No government should be expected to undertake costly commitments to a price stabilization reserve without assurance that other governments will do their share. The vague “guidelines” adopted at the World Food Conference¹⁵ do not provide such assurance; in effect, each national government is to set its own targets and to adopt its own policies on the acquisition and release of stocks.

As matters stand, there is not even complete agreement on the basic purpose of an international reserve. If the objective is limited to the relief of famine in poor countries, a modest reserve of some 20 million tons, consisting mainly of wheat, would probably be sufficient. The principal problems would be how to share the cost, and what rules to adopt concerning the acquisition, control and release of the stocks. Another major problem would be how to resist the inevitable pressures from developing countries for the release of stocks in situations short of emergencies—particularly if these stocks are physically held in developing countries.

When United States Secretary of State Henry Kissinger mentioned a 60-million-ton target in his address at the World Food Conference, he obviously

had more than famine relief in mind. Estimates by FAO and by the United States Department of Agriculture¹⁶ indicate that a reserve of between 50 and 80 million tons of grain (food and feedgrains) would be required to assure reasonable stability of supplies and prices in periods of severe crop shortfalls. An even larger reserve, over 80 million tons, would have been required to ride out the series of crop shortfalls in 1972 and 1974 without significant price increases.¹⁷

Governments naturally shy away from the costs of carrying such insurance, which are substantial (from \$280 to \$450 million annually in storage costs, plus interest charges, less profits on resale). These costs can be reduced if governments are prepared to tolerate price fluctuations within a certain range. In any event, since both exporting countries and importing countries would benefit from a price stabilization reserve, they should be prepared to share the cost on the basis of some formula that takes account of a country's wealth and its share in world grain trade. It may also be argued that a country like the Soviet Union, whose grain production and import requirements are highly variable from year to year, should pay a special “high-risk” premium for the privilege of drawing on world reserves.

The price range presents difficult negotiating issues. The floor price, at which stocks would be built up, should not be so high as to overstimulate production beyond the quantities needed for stabilization, and not so low as to discourage production. The price range should be wide enough to permit prices to perform their normal role in guiding producers' and consumers' responses to long-term changes in demand/supply relationships. Flexibility is needed at both ends of the price range in order to space purchases for the stockpile and releases from the stockpile in such a way as not to disrupt markets. Provisions must be made for periodic reviews of the price range to ensure that the reserve serves stabilization purposes only and is not perverted into an instrument of long-term price support for exporters, or subsidization of importers. What is needed is an arrangement in which the price range is the function of a “presumptive indicator” to guide the management of the reserve, not an automatic trigger or an absolute floor or ceiling.

The costs involved in carrying reserves, and the desire to avoid conflicts with domestic agricultural policies, have inspired a number of alternative approaches to the problem of stabilization. One proposal, mentioned earlier, would leave the responsibility for holding reserves entirely to private holders. It seems clear, however, that private holders cannot be expected to finance stocks sufficient to meet major contingencies that may occur only every six to eight years. Privately held stocks can serve a useful function in smoothing out minor price fluctuations. But in situations of severe shortage or glut, private

¹⁵ *The World Food Problem: Proposals for National and International Action*, chapter 14, annex A.

¹⁶ U.N. Food and Agriculture Organization, *World Food Situation: Evaluation of World Cereals Stock Situation* (Rome, September, 1974); USDA, Economic Research Service, *The World Food Situation and Prospects to 1985*, chapter 5.

¹⁷ See note 3.

stockholding decisions may actually intensify price fluctuations.

Another approach is the fixing of limits to international trading prices, not through the operation of buffer stocks, but through export taxes to keep export prices at or above the minimum, and export subsidies to keep them at or below the maximum. International commodity agreements of this type, to be workable, require allocations, when prices are at the extremes of the range, to apportion the surplus or shortage, as the case may be; and to the extent that they must resort to rationing, they fail to provide assurance of adequate supplies in periods of shortage. Furthermore, experience with the International Grains Arrangement, the International Coffee Agreement, the International Sugar Agreement, and the Commonwealth Sugar Agreement has shown that agreements on maximum and minimum prices not backed up by provisions for stock management tend to break down under stress.

Another variant of a commodity agreement relying primarily on price provisions is the "multilateral contract," as exemplified by the International Wheat Agreements of 1949, 1953 and 1956. In this type of agreement, a group of exporting countries guarantees to sell specified quantities to a group of importing countries at a specified maximum price when world market prices are above the maximum; the importers, in return, commit themselves to purchasing a specified quantity at a minimum price when world market prices are below the minimum.¹⁸

While multilateral contracts are more enforceable than commodity agreements that do not specify quantities to be supplied or purchased, they are also subject to stresses when market prices exceed the limits of the price range. Thus, some of the importing countries that were parties to the first International Wheat Agreement were glad to profit from the maximum price provisions while wheat was in short supply but lost interest in renewing the arrangement when the market turned soft. The minimum price provisions were never tested because the United States and Canada voluntarily intervened to support the market in periods of glut.

Another drawback is that stabilization of part of the world market will tend to increase the volatility of the residual market. This is what happened in the world sugar market when the United States, Great Britain and the European Community extended minimum prices and purchase guarantees for spec-

ified quantities to selected suppliers. The effect of these preferential arrangements was to intensify price fluctuations in the free market.

What are the prospects for negotiating international stabilization agreements for grains (and possibly other foodstuffs like sugar)? There have been indications of interest on the part of the European Community, Japan, and certain exporting countries in preliminary talks at the headquarters of the International Wheat Council in London and in the multilateral trade negotiations now getting under way in Geneva. The United States position on this issue is likely to be linked to the willingness of the European Community and other importing countries to negotiate simultaneously a reduction of their levels of support and protection. There are two possibilities: an international agreement on reserves only, or a broader agreement dealing with all aspects of international grain trade.

FOOD AID

For the first time in the history of mankind, the eradication of hunger and malnutrition has become a practical possibility. Although the problem of feeding 400 million undernourished people may seem staggering at first sight, it is far from unmanageable: it would take no more than 25 million tons of grain—about 2 percent of world grain production—to meet their minimum nutritional requirements.¹⁹

As we have acquired the means to cope with the problems of hunger and malnutrition, we also have become more sensitive to them. Images of human suffering in distant lands are projected almost instantly into our homes. Rich and poor countries alike have become aware of their interdependence and are less willing to tolerate conditions that are intolerable.

The first organized international effort to deal with hunger and malnutrition goes back to World War II when the United States, Great Britain and Canada joined forces to set up the Combined Food Board (CFB). Its mission was to formulate plans for food production, transportation and distribution for the allied countries and for areas liberated or occupied by the allied armies. An international agency, the United Nations Relief and Rehabilitation Agency (UNRRA), was established in 1943 to supplement these efforts. The CFB was succeeded in 1946 by the International Emergency Food Council, with broader membership.²⁰

(Continued on page 276)

¹⁸ United States Senate, Committee on Foreign Relations, *The International Wheat Agreement*, Hearings, May 14-17, 1948. In later versions of the IWA, the quantitative purchase commitments of the importing countries were progressively diluted.

¹⁹ USDA, Economic Research Service, *The World Food Situation and Prospects to 1985*, chapter 6.

²⁰ Eric Roll, *The Combined Food Board* (Stanford: Stanford University Press, 1956).

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VIRGINIA C. KNIGHT

(PART II OF THIS LIST WILL APPEAR IN OUR NEXT ISSUE.)

FOOD AND FOOD POLICY IN THE INDUSTRIAL NATIONS

(Continued from page 244)

world's demand for food increases, artificial restraints that prevent growth and expansion in areas with the greatest capacity and lowest cost become increasingly intolerable. The issues of concern are trade policies and the interrelated mix of domestic price support programs that influence the location, composition, and growth rate of agricultural output.

Another set of issues centers on what may be termed structural imbalances in the international food situation, namely, the problems of expanding production and providing food for large numbers of low-income people in poor countries where foreign exchange reserves do not exist. Policy issues here relate to whether sufficient transfers of wealth from rich countries can be arranged, and what form they should take.

A third concern is the problem of short-term variability, food security and stabilization to deal with unforeseen shortages. Some individual nations periodically need emergency supplies to prevent starvation. Even small variations in world supplies can create great changes in food prices that are of critical importance to food deficit nations. Major food surpluses resulting from the domestic policies of individual governments can no longer be counted on to cover these contingencies.

The effects of domestic agricultural policies on production, consumption, and trade derive from responses to the price incentives given to producers and from government programs to limit or expand total agricultural production. In years past, a significant proportion of the United States and Canadian agricultural production capacity was idled by government programs. This is no longer true. Increased production is needed to meet market and humanitarian demands and to rebuild stocks. Additional important gains could be achieved through growth and the expansion of production in areas with unused or inadequately exploited agricultural resources.

Industrial countries follow one of two basic approaches to international trade policy. Either they seek to promote a reduction in tariffs and other restrictions to trade among countries, or they are protectionist, with inefficient, high-cost agricultural systems that cannot effectively compete in world markets. Many European countries, especially members of the Economic Community, are protectionist. Since the early 1960's, the United States has attempted without much success to institute liberalized trade policies on

a worldwide basis. But because agriculture and food production are basic industries in all countries, they remain highly protected. Thus, aggregate world agricultural production is less than it could be.

If agricultural products were free to be traded, world resources could be used more effectively, because each country would produce those commodities for which it had decided resource and cost advantages. Better production distribution could be achieved among industrial countries. Many less developed countries also have considerable potential for expanding production beyond their domestic consumption needs. An investment program in agriculture, combined with more liberal trading relationships and stable markets, would enable these countries to expand their agricultural exports and to improve their foreign exchange earnings, and would encourage increased purchases for industrial and agricultural development.

One thing must be remembered about trade liberalization, however. Only nations with adequate buying power in the form of foreign exchange are able to enter the world food market. Many developing countries cannot gain access to food through commercial markets. Thus, while freer agricultural trade benefits the world by increasing the quantity and lowering the real cost of food products, there is no guarantee that poor people will gain.

The Western industrial nations, the United States in particular, have tried to help these poor people through aid programs. Agricultural foreign aid consists of two primary components: food aid and technical assistance. But the role of food aid is limited. There is broad consensus that food aid should be made available in case of natural disasters or other emergencies and when developing countries suffer from rising food and/or fertilizer prices. However, if continued, food aid can create disincentives to production in the recipient country because it reduces prices to domestic farmers and, most of all, reduces the need for governments to make the hard policy choices required to increase food output.

In the past, surpluses caused by domestic programs aimed at supporting incomes for farmers in industrial countries have provided sufficient stocks for disaster relief as well as for other unusual shortfalls. Additionally, they have been used in part for development purposes. While food aid can continue to serve a useful purpose for countries chronically short of food and foreign exchange, a permanent solution to the food problems of these nations can be found only in programs designed to redress the balance between their population growth and food production. A recent estimate prepared for the World Food Conference states that on the basis of present trends, the food import needs of the less developed countries could reach 85 million metric tons by 1985.⁹ At current prices,

⁹ United Nations World Food Conference, *Assessment of the World Food Situation; Present and Future*, Item 8 of the Provisional Agenda (Rome, November, 1974).

this would require an outlay of \$15 to \$17 billion. Clearly, these countries cannot afford purchases of this magnitude, and food aid of this magnitude is not in sight.

Meaningful progress can be made over the next 10 years only by means of significant increases in technical assistance and capital from foreign sources. This involves programs to meet urgent requirements for annual inputs, particularly fertilizer, and for long-term investment in developing land and water resources. Human capacities and institutional systems must also be improved.

While output expansion in these countries should not be pursued without regard to its relative cost, substantial growth in most less developed importing countries is both desirable and feasible and provides a solution preferable to massive increases in the amount of food aid.

Finally, past policies in industrial countries have resulted in a bias toward the production and consumption of livestock products. There is much appeal in the argument that meat consumption should be reduced in order to free grain for hungry people. While the argument seems logical, close analysis sheds doubt on the effectiveness of such a policy. Grain is only part of the total feed consumed by ruminant livestock. A substantial proportion of livestock feed is roughage, which is available for human consumption only when converted into animal protein. Further, the grains saved would not be available where they are needed. Without improved distribution and transportation systems and without an outlay of unprecedented amounts of money for food aid, the grain saved would not be utilized for human consumption.

Stability in food markets is desirable for a number of reasons. Extreme price fluctuations of the kind that have occurred in the past two years are disruptive, particularly for low-income consumers. Sharp price fluctuations are also of concern to farmers. Prices have fluctuated among commodities, through time, from very high levels, to current lows in beef products. Increasing capital requirements make it harder for farmers to absorb losses when prices drop sharply. The inevitable overall result of uncertainty is to reduce the farmers' willingness to invest and to generate the increased output that is needed.

Most developing nations (except the major oil exporters) have balance-of-payments problems that disrupt national planning efforts and internal economic stability. For individual exporting and importing

countries, sharp changes in food prices seriously affect import costs or export earnings, and have a major impact on balance of payments. These problems are accentuated by high energy costs. In the extreme, because of supply fluctuations, major starvation can occur in some countries.

A FOOD RESERVE

An international food reserve would help create desired stability in two ways. The stocks would act as a source of emergency relief for disaster situations. In addition, a food security system would provide a buffer for sporadic yearly production shortfalls and price fluctuations, like those suffered in 1972 and 1974. However, a food security stocks policy must generate the benefits of stability without simultaneously creating longer term detrimental effects by creating low prices that would reduce incentives to individual farmers to expand output, and would reduce incentives to countries to develop increased food production.

Clearly, stabilization procedures would have to be judiciously managed. Otherwise, a program of disaster relief might become a vehicle for the permanent transfer of food to some areas of the world. Stocks for humanitarian purposes should become a component of international food policy and should be handled as an international effort.

Stocks to overcome extreme price fluctuations in commercial markets, on the other hand, can probably be managed effectively only through the coordination of national stock policies. Stocks would have to be acquired and dispersed to retain prices within a range agreeable to both exporters and importers, and all major traders would necessarily be involved. In the case of importing nations, stocks would be required largely to cover shortfalls and fluctuations from trends in import requirements. In exporting nations, stocks would be accumulated in years when production is above domestic and export requirements and would be designed to cover fluctuations in exports not covered by internationally held food reserves or reserves in major importing countries.

The policy management problem would be most acute in exporting nations. Events during the past year have shown that very large amounts of grain can quickly be withdrawn from stocks when major shortfalls occur simultaneously in several parts of the world. Both exporters and importers must share responsibility for overcoming these contingencies.

The developed nations of West Europe, North America, Oceania and Japan possess agricultural wealth and resources. Their food production decisions, consumption patterns, and internal policy choices directly affect the rest of the world. Food is a global issue. At the very least, the rich nations have a moral obligation to recognize and understand the global impact of their food-related decisions. ■

ERRATUM: We regret that in our March, 1975, issue, in the article, "Italy in Trouble," by Pellegrino Nazzaro, we incorrectly referred to Palmiro Togliatti as Pietro Togliatti and to Alcide De Gasperi as Antonio De Gasperi, on pp. 102 and 135, respectively. This was an editorial error.

THE ASIAN DILEMMA

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advanced technology (large tractor). Except in Communist China, where intermediate, domestically generated farm technology is on the rise, Asian developing countries still rely on an often incompatible mixture of traditional and advanced (usually imported) technology, with the former predominant. There is much room here for relatively inexpensive improvement. Even without the benefit of "miracle" plant strains and green revolutions, the same acreage can give two or three harvests, where formerly one was the rule, with proper and incrementally modernized management. The nutrient value of chemical fertilizers need not be up to North American or Japanese standards to improve on present yields, and bricks for rural construction do not have to be untouched by human hand to serve a useful, productive purpose. Over most of Asia, intermediate, relatively labor-intensive technology, using indigenous raw materials and fuels, could go a long way toward raising the output per head and per acre of badly needed food crops. Considering China's experience, there seems to be no compelling technical or even financial reason why the per acre yield of staple foods should not be doubled in most Asian countries within a fairly brief span of time. What seems to be missing is not the technical potential but the political commitment of governments to agricultural modernization through self-reliance. What is lacking in most Asian countries is the capacity to harness the collective will, the motivation to inspire, cajole, goad, and—if necessary—push the masses of peasants toward a modernization of farming techniques that is meaningful to their everyday lives. Neither international war-on-hunger symposia attended by well-fed political figures nor ecumenical 24-hour fasts in the industrialized countries will do it.

Thus, the other, perhaps the key component of production, is social organization. It includes many factors, from the system of land tenure to the form of local and national government. In many parts of the continent, land tenure systems (including, for example, less than optimal—not to say miniscule—sized farms, or absentee landownership) constitute a formidable obstacle to technical advances in agriculture. A similar barrier consists of the relatively low position of agriculture on national scales of priorities. It is not unusual for the governments of newly independent countries to stress capital-intensive heavy industries and other "political factories" and prestige projects to the neglect of agriculture. Excessive reliance on advanced imported technology, which the developing country is unable to absorb, and on foreign aid, which as a matter of practical international politics will never be enough, are frequently ill-conceived and ultimately

counterproductive. Foreign aid especially, although justified on humanitarian grounds, has tended in some instances to delay needed social adjustments by temporarily dissimulating the urgency of the recipient nation's problem. Here, again, Communist China stands out as an exception to what is practically the rule.

A number of relatively simple measures could be taken to reduce waste, for example, through the control of pests and the reduction of crop spoilage in transport and storage. Such measures, as the Chinese have shown, do not necessarily call for large expenditures on pesticides, sprayers, and other equipment. They do, however, call for the mobilization of the work force to that end. In India, rats gobble up perhaps as much as 10 to 15 percent of the annual grain harvest. One hectare feeds 30 people and 275 rats. In China before the war, some 12 million tons of cereals were lost every year to rats and other pests. In 1952 alone, in the course of a nationwide anti-pest campaign, 120 million rats were killed, 160 million tons of garbage were cleared away, and 2 million pounds of flies and mosquitoes were scooped up. On a more modest scale, the campaign has been repeated twice a year ever since. The grain saved by the elimination of rats alone represents roughly a 3-year-increase in China's grain output (assuming good harvest years), to say nothing of the general benefit to public health. Similar savings could be made in most Asian countries on natural manure, especially nightsoil, even without going to the lengths and massiveness of China's mobilization effort. Lest this be interpreted to mean callous preaching to the poor, let it be added that waste is not the exclusive property of the developing nations; the food thrown away and otherwise wasted (for example in processing) in the industrialized countries is well documented. This, however, does not alter the basic argument that between 10 and 15 percent could be added to the Asian food supply *on the spot*, without international transfers and financial transactions, by public hygiene and other measures using traditional and intermediate technology.

Malnutrition in most of Asia is a reality. The fight against this must come on two fronts simultaneously, attacking population size and increasing food production. Family planning and the reduction of the rate of natural increase to at least 1 percent per annum are indispensable. Such an undertaking will require commitment by the governments of the developing Asian countries, including vast educational efforts. At the same time, a substantial rise in food production is technologically possible. To translate the available traditional and intermediate (plus some advanced) technology into food output, a sizable government effort is needed. In many countries, such an effort must rest on a restructuring of national priorities. ■

LATIN AMERICA

(Continued from page 257)

two large countries, Brazil and Mexico, and two medium-sized ones, Colombia and Venezuela, will be increasing in population rapidly. El Salvador, Haiti, the Dominican Republic, Honduras and Nicaragua will still be experiencing a population explosion. Their population will be between three and four times the population they registered in 1960. Even if some agricultural expansion occurs in these small countries, it is hard to foresee how they can feed such a population.

Up to the present, contraception has not proved effective where it has been introduced. The current decline in fertility seems to be associated with socio-economic improvements rather than the spread of birth control techniques. Even if a strict limitation on births could be suddenly imposed—a contingency not likely—large generations of children will continue to be born in the year 2000 because of the age composition of the present female population. Contraception may mitigate the explosion, but it will not control it.

Too many variables enter into what is referred to as a demographic pressure. The discussion has been intentionally restricted here to two terms of the implied relationship: the available surface and the active population in agriculture. These two magnitudes seem basic; other factors depend on attitudes or aims that are easier to reverse or on elements that are outside regional control.

Inspired by the "demonstration effect" of the highly developed countries, the Latin American nations intend to achieve a consumerist industrial society requiring a permanent accumulation of capital and an abundant flow of natural energy. Such a society is labor-saving oriented and tries to invest the scarce capital available in sectors where maximum monetary profit can be obtained, i.e., to a large extent, in industry. A society of this kind is barely able to absorb the expanding Latin American population in its work force and may suffer food shortages.

A reverse of the present trend was unthinkable before the current energy crisis. Prospects for such a change are still slim, but the rationale for building a wasteful industrial and highly urbanized society is currently being challenged. A society where profit is not the leading consideration and where life and production are less violently adjusted to the ecological

⁵ The change will imply, to a large extent, a shift from ranching, extensively practiced there, to farming. In this way a maximum of edible energy for human beings could be extracted from the earth. Although animal proteins are richer than those obtained from vegetables or grains, there is a considerable loss of energy when plants are converted into meat. Thus, the same land may sustain a larger population producing grains instead of animal pastures when resources are scarce.

environment are being studied. Such a society may employ a larger human mass, although its standard of living will never reach that of the most developed countries.

It seems unlikely that temperate South America, thinly populated and with a low rate of population growth, will be motivated to deemphasize its industrial and urban development in order to take full advantage of its great agricultural potential.⁵

The nations that share the Amazon basin, Brazil in particular, have room for an agricultural expansion that may sustain their growing population. Some efforts have been made in this direction, although progress has been slow. Nature is hard to tame, but no sustained endeavor has yet been undertaken.

The risk of an imbalance between local agricultural resources and human needs seems greater in Central America and the Caribbean. Chances for land reclamation or for more intensive cultivation are lower in this area, while population will continue to increase very fast. Industrial development can bring little relief. However, if population pressure becomes unbearable in Central America and the Caribbean by the end of this century, it will be the consequence of a choice. To make no decision is also a choice.

From now to the end of this century the population of Latin America will continue to grow. Locally supplied food to feed Latin Americans may also increase, if some difficult decisions are made. Food resources may keep pace with the expanding population, but this possibility cannot be taken for granted, as it seemed to be half a century ago. ■

THE WORLD FOOD PROBLEM

(Continued from page 270)

These programs were intended to be of limited duration, to cope with wartime and postwar emergencies. The first program to deal with hunger and malnutrition on a continuing basis was launched in 1954 with the enactment by the United States Congress of the Agricultural Trade, Development and Assistance Act (Public Law 480). Originally conceived as a surplus disposal program, PL 480 has survived the disappearance of the surpluses. It has become accepted as an aid program in its own right, supplementing other forms of international assistance. Food aid now accounts for almost one-half of total United States economic aid to developing countries.

However, as United States agricultural surpluses were reduced and then disappeared, the public became increasingly aware of the cost of the program, and it seemed fair to ask why this cost should not be shared by other affluent countries.

The World Food Program (WFP) began in 1962 under the auspices of the United Nations and the

FAO.²¹ Its resources, which come from voluntary contributions of commodities, cash and services from 82 member countries, have been increased from an annual level of about \$30 million in the first pledging period to approximately \$200 million at present.

A Food Aid Convention was negotiated in 1967 as part of the International Grains Arrangement.²² It provides for firm commitments of 4.25 million tons of grain annually, as follows: United States, 1,890,000 tons; the European Community of Six, 1,035,000 tons; Canada, 495,000 tons; Australia, the United Kingdom and Japan, 225,000 tons each; with smaller quantities contributed by Argentina, Switzerland, Sweden, Norway, Denmark and Finland. At current grain prices, the total value of these contributions is about \$700 million. Originally agreed to only reluctantly by the importing countries as a "concession" to the United States in the Kennedy Round of trade negotiations, the Food Aid Convention turned out to be the most durable and least controversial part of the International Grains Arrangement.

Many donor countries who would have shied away from the administrative problems and expense of a bilateral program have been encouraged to make contributions to international food aid by multilateral food aid programs. The European Community has become a major donor, with a food aid budget of around \$300 million. Since 1965, total foreign contributions have increased from \$76 million (6 percent of the total) to over \$500 million (41 percent) in 1973, while the United States contribution has declined, not only in terms of its share of the total, but also absolutely (from \$1,234 million in 1965 to \$730 million in 1973).²³ This year, however the United States has budgeted a substantial increase in its food aid effort, to about \$1.6 billion.

Total grain shipments financed by food aid programs, which reached a low of about 5 million tons in 1973/1974, are likely to increase to about 8 million tons in 1975, of which about 5 million tons will be supplied by the United States. As grain prices decline, it should be feasible to increase these quantities to the rather modest 10 million-ton target set by the World Food Conference. This could be accomplished by increasing the quotas under the Food Aid Convention from 4.2 million tons to 10 million tons.

Food aid has come under increasing criticism in

recent years on the ground that it does not always reach the people who need it most, and that it may discourage efforts in the developing countries to increase agricultural production and to control population growth. To the extent that these criticisms are valid, they point to weaknesses that can be remedied in the administration of the programs.

For maximum effectiveness in raising levels of nutrition, food aid should be channeled, as far as possible, to the urban and rural poor, and to school lunch and other special feeding programs. Such distributions would result in additional consumption and would thus largely avoid interference with farmers' normal commercial sales.

If properly managed, food aid can make an effective contribution to agricultural development, for example, if the proceeds of local sales are used to finance investments in agriculture and related activities. The WFP programs and the "Food for Work" programs of the United States Agency for International Development have shown that food can also be used directly as wages on labor-intensive rural development projects that would not otherwise be undertaken, such as construction of storage facilities, road construction and minor irrigation projects.²⁴

AGRICULTURAL DEVELOPMENT ASSISTANCE

Although food aid can be used as an effective instrument of agricultural development aid, it should be regarded only as a supplement to other forms of development assistance, such as the financing of investments in fertilizer and pesticide production facilities, major irrigation projects, research facilities and extension services.

Until about eight years ago, agriculture was the neglected sector in most developing countries: only a small fraction of total investment and of external development assistance was devoted to increasing food production. The Indian food crisis of the mid-1960's gave the first stimulus to a gradual shift in emphasis toward agricultural and related projects. The World Bank (IBRD) and the International Development Association (IDA) are now devoting about one-fourth of their resources to agriculture, as compared with 15 percent in 1972.²⁵ But the OECD estimates that in 1973, only some 8 percent of the total bilateral aid and up to 15 percent of the aid from international agencies was directed to agricultural development.²⁶ This would put development assistance to agriculture at about one billion dollars—far short of what it should be, considering the relative importance of agriculture in the economy of most developing countries.

The most urgent problem is to increase the availability of fertilizer. Prices of nitrogenous fertilizer have tripled since 1972; prices of other fertilizers have doubled—a far greater increase than can be

²¹ U.N. Food and Agriculture Organization, *Ten Years of World Food Program Development Aid, 1963-72* (Rome, 1973).

²² Fred H. Sanderson, *The International Grains Arrangement*, State Department Bulletin, 1968.

²³ USDA, Economic Research Service, *The World Food Situation and Prospects to 1985*, chapter 7.

²⁴ See note 20.

²⁵ World Bank, *Annual Report*, 1974, p. 16.

²⁶ OECD, Development Assistance Committee, *Development Cooperation*, 1974 Review (Paris, November, 1974), p. 23.

explained by the increasing costs of energy used in their production. Developing countries have had difficulties in securing supplies regardless of price. It will probably take several years before planned additions to production capacity catch up with world demand. For economic reasons, much of the new investment in nitrogenous fertilizer capacity may be expected to be located in petroleum-exporting countries. A thought that suggests itself is that these countries could supply a portion of their output to developing countries on concessional terms, just as food exporting countries have done.

The World Food Conference, the OECD and the World Bank have all called for a reordering of development priorities in favor of an all-out effort to raise agricultural production. With substantial contributions from the oil-exporting countries, it should be entirely feasible to double the flow of such aid. This effort, however, will be fruitful only to the extent that the governments of the developing countries redirect their domestic priorities toward the rural sector, whose backwardness, in many cases, has become the major constraint on their general economic development. ■

FOOD AND POPULATION IN AFRICA

(Continued from page 261)

more than two-fifths of the African countries, there were actual declines in per capita food production.

Necessary food supplies can be increased either through greater imports or through higher productivity on African farms. Prospects for increased imports are limited; most countries in Africa are too poor and underdeveloped for this to be a realistic alternative in a world of high commodity prices. Ultimately, increased food supplies in Africa will depend on increased domestic production. This, in turn, will depend on the further development of agricultural technology and organization.

The great majority of the 300 million rural people of Africa are peasant farmers; prospects for increased production depend very heavily on their existing practices and the kinds of changes that may take place. There are some broad regional differences—in general, agriculture in North Africa is more highly developed. However, throughout sub-Saharan Africa, peasant agriculture remains predominant.

By far the most widely used farm tools of Africa are the machete (variously called a "panga" or "cutlass"), a broad-bladed short-handled hoe, and (in some places) the simplest agricultural implement of all, the digging stick. There is little use of draft animals and even less of machines. Farm buildings and facilities are usually simple and limited

to what can be produced by hand. In particular, storage for grain and other crops is generally inadequate, and losses because of spoilage and vermin are high. One study in Ghana showed that food crop losses of some 30 percent of the total occur in storage. (It is of interest to note that one of the main virtues of starchy root crops like yams and cassava is that they store better than grains and pulses. This plus the fact that they grow under more adverse conditions goes far to compensate for their lack of food value.)

There is comparatively little use of fertilizer or of improved seed yet in most of Africa. Indeed, the sustained research devoted to rice and wheat in other parts of the world has only just begun to include basic African crops like sorghum, millet, yams, and cassava (in particular at the International Institute for Tropical Agriculture in Nigeria).

The slight use of inorganic fertilizer and of manure is one reason farmers depend heavily on an old and very wasteful technique: some form of slash-and-burn agriculture. Land is allowed to go fallow after it is cultivated for a few years without fertilizer. After the land has rested and a cover of wild brush has reestablished itself, it is returned to cultivation by burning off the brush just before seeding. Burning retards the growth of weeds and the ashes provide some nutrients for the soil. Obviously this system, with its extravagant use of land, is ill adapted to increasing population densities. If the period of fallow shortens, as it must when rural densities rise, soil fertility falls, and productivity will decline. Yet slash-and-burn agriculture continues in many parts of Africa.

Not surprisingly, productivity is low when farming is based on these techniques. The system of land tenure most widespread in sub-Saharan Africa also impedes increased productivity. In general, land ownership is not vested in an individual but in an extended kinship group. This communal group allocates land to individual households on the basis of their needs and ability. Since possession is never permanent or unqualified, the investment of money or labor in long-term improvements may be deterred. In addition, land is not available as collateral to raise capital to borrow for agricultural improvement.

Under these conditions, most agricultural production is for home consumption. Surpluses which might be sold are small. Moreover, the market system through which surpluses could be sold is itself often rudimentary.

It is very important to recognize that the conditions associated with low productivity in African peasant agriculture are not a reflection of stubborn backwardness. On the contrary, African agricultural practice and the urban labor migration of men are reasonable

(Continued on page 288)

THE MONTH IN REVIEW

A CURRENT HISTORY chronology covering the most important events of April, 1975, to provide a day-by-day summary of world affairs.

INTERNATIONAL

Association of Iron-Ore Exporting Countries

Apr. 2—11 iron-ore exporting countries establish an association; no commitments to set prices are made.

Commonwealth of Nations

Apr. 29—In Kingston, Jamaica, a meeting of 33 Commonwealth nations begins.

Disarmament Conference in Vienna

Apr. 19—Concluding their 5th round of talks, the delegates to the conference on mutual and balanced force reduction in central Europe recess for 3 weeks; no measurable progress is reported.

European Economic Community (EEC, Common Market)

(See also *United Kingdom, Great Britain*)

Apr. 24—The Common Market abandons export subsidies on a wide variety of cheeses; the U.S. Treasury Department says it will not set "countervailing duties" on the expensive, subsidized cheeses from Europe. In effect, this is a truce in the undeclared "cheese war" between the U.S. and Common Market nations.

International Coffee Organization

Apr. 2—It is announced at the United Nations that 57 nations have agreed to extend the 1968 International Coffee Agreement to September 30, 1976.

International Energy Conference

Apr. 7—Preliminary talks open in Paris to plan for a world energy conference later in 1975. Oil-producing and oil-consuming nations are meeting for the 1st time since the Arab oil embargo of 1973.

Apr. 15—The preliminary meeting adjourns without agreement on an agenda for the conference.

International Monetary Fund (IMF)

Apr. 6—The IMF reveals that its special "Oil Facility," set up to lend money to nations that need loans because of the higher cost of imported oil, will be extended another year.

Middle East Crisis

(See also *Egypt; Syria; U.S.S.R.; U.S., Foreign Policy*)

Apr. 1—Egyptian Foreign Minister Ismail Fahmy formally asks the United States and the Soviet Union (cochairmen of the Geneva Conference) to reconvene the Geneva Conference on the Middle East.

Apr. 5—It is reported in Cairo that the U.S.S.R. has replied to the April 1 Egyptian request, saying that detailed preparations must be made for the conference.

Apr. 8—It is disclosed at the U.N. that Security Council members have unofficially agreed to extend the mandate for the U.N. peace-keeping force in the Sinai three months.

Apr. 27—A Syrian Baath party representative says that Syria has extended the U.N. peace-keeping mandate in the Golan Heights for 2 months after the May 31 expiration date.

Organization for Economic Cooperation and Development (OECD)

Apr. 8—The chairman of the OECD's Development Assistance Committee reports that oil-exporting states gave one-sixth of the official development aid given by the rich to the poorer nations in 1974. Oil-producing nations gave \$2.5 billion in official programs.

Apr. 9—In Paris, finance ministers from 23 of the 24 members of OECD agree to establish a \$25-billion lending facility for industrial states that are suffering because of the high price of oil. Turkey, the 24th member, is expected to sign the agreement in May.

Organization of African Unity (OAU)

Apr. 11—In Dar es Salaam, the Council of Ministers of the OAU declares it approves the action of some African states that are acting as go-betweens in talks between the government of Rhodesia and Rhodesian nationalists; it supports efforts to negotiate between South-West Africa and the government of South Africa on the question of South-West Africa's independence. Delegates also call for an intensified boycott of South Africa.

United Nations

(See *Intl, Middle East Crisis*)

War in Indochina

CAMBODIA

(See also *Cambodia*)

Apr. 1—"Interim President" Saukam Khoy takes over as President Lon Nol leaves the country.

Apr. 2—The U.S. embassy begins to evacuate its staff from Phnom Penh.

Apr. 12—Premier Long Boret reveals that a military-dominated "summit committee" has taken over the government; acting President Khoy flees with the U.S. ambassador.

Apr. 14—In Peking, Prince Norodom Sihanouk says he will withdraw from public life when the war in Cambodia ends. He is the leader of the Khmer National United Front and is not a Communist (Khmer Rouge).

Apr. 16—The military government of Cambodia in Phnom Penh capitulates to the rebels and asks for a truce. The Communists take power in Phnom Penh.

Apr. 17—In Paris, Sihanouk's special representative says that Sihanouk remains chief of state in Cambodia and will return there "when circumstances permit."

Apr. 18—Thailand, Malaysia, Indonesia, Singapore and the Philippines—the 5 members of the Association of Southeast Asian countries—jointly recognize the new government of Cambodia.

VIETNAM

Apr. 3—U.S. President Gerald Ford tells a news conference in San Diego that "the United States has been doing and

will continue to do its utmost" to help South Vietnamese refugees. The President says South Vietnam's losses should not be regarded as a sign that the U.S. will not honor its commitments.

Apr. 4—A U.S. Air Force transport crashes near Saigon with 243 Vietnamese orphans aboard. More than 100 children die in the crash.

South Vietnamese President Nguyen Van Thieu names Nguyen Ba Can, speaker of the lower house of Parliament, as Premier, succeeding General Tran Thien Khiem.

Apr. 6—South Vietnam's Action Committee for National Salvation, supported by former Premier Nguyen Cao Ky, asks Thieu to resign.

Apr. 21—President Thieu resigns; he charges that the U.S. is an untrustworthy ally. He names Vice President Tran Van Huong to succeed him.

Apr. 24—In Washington, L. Dean Brown, directing President Ford's Refugee Task Force, says that some 5,000 refugees are being flown from Vietnam to Guam every day.

A Vietcong broadcast rejects any "constitutional solution" for Vietnam and says the present government is unacceptable, implying that only General Duong Van Minh, "Big Minh," will be acceptable as head of the Saigon government.

Apr. 26—The National Assembly authorizes President Tran Van Huong to "select a man to replace him" to negotiate a peace treaty with the Vietcong.

Apr. 28—The National Assembly approves General Duong Van Minh as President.

Saigon is shelled by Communist rockets.

Apr. 29—General Minh assumes the presidency. The Vietcong reject his appeal for reconciliation; the attack on Saigon continues.

Tan Son Nhut Air Base is attacked.

Apr. 30—President Minh announces the unconditional surrender of the Saigon government and its military to the Vietcong.

The evacuation of all Americans from Saigon is completed. Nearly 50,000 South Vietnamese have been evacuated by the U.S. in the last 2 weeks.

Communist troops of North Vietnam and the Provisional Revolutionary Government of South Vietnam take over the Saigon government. All telephone and telegraph communications with Saigon have ended.

In a radio broadcast from Peking, it is announced that Saigon will be renamed "Ho Chi Minh City."

In Paris, the Provisional Revolutionary Government announces the liberation of South Vietnam and says that the new regime will follow a policy of "peace and non-alignment."

ALGERIA

(See *France*)

ARGENTINA

Apr. 12—Steelworkers in the north continue their protest strike against the government's arrest of union leaders March 20.

Apr. 14—Returns from the April 13 elections in Misiones province show President Isabel Martinez de Perón's conservative Peronist supporters winning 46 percent of the vote in the contest for governor and deputy governor. The opposition left-wing Peronists win only 9 percent of the vote.

Apr. 22—Former President Héctor J. Campora is expelled from membership in the Peronist movement. He has

been living in self-imposed exile in Mexico since the death of General Juan Domingo Perón in July, 1974.

BELGIUM

(See *China*)

CAMBODIA

(See also *Intl, War in Indochina, Cambodia*)

Apr. 22—The commander of Communist forces in Cambodia, Khieu Samphan, who is also deputy premier and defense minister, declares that his government's foreign policy will be "neutrality, independence within our borders—we will be neutral and nonaligned."

Apr. 24—Agence France-Presse in Bangkok reports that the news blackout in Phnom Penh is in its 7th day.

The Phnom Penh radio says that 3 days of celebration for the Communist victory and 1 week of mourning for the war dead is beginning.

Apr. 25—According to Phnom Penh radio, the government has appointed Prince Sihanouk chief of state for life. It is also announced that all Cambodian diplomats serving abroad will be replaced.

Apr. 28—At the close of the 3d National Congress held by the Khmer Rouge, a resolution by the 311 delegates says that Cambodia will not allow any foreign military bases on her territory.

CHAD

Apr. 4—In a radio broadcast, President Ngarta Tombalbaye says the army is a corrupt "state within a state."

The commander and deputy commander of the national police are arrested on Tombalbaye's orders following 2 fires at the Chad Security Company arsenals on April 3, and an incident at the national gendarmerie.

Apr. 13—In a radio broadcast, the acting army chief of staff, General Noel Odingar, announces that President Tombalbaye has been killed by soldiers in an attack on the presidential palace. General Odingar announces the release of the military officers arrested April 4.

Apr. 15—8 ministers of former President Tombalbaye are arrested.

Apr. 16—In a radio broadcast, it is announced that Brigadier General Felix Malloum will head the 9-member Supreme Military Council. General Odingar is named to the council, as is Captain Kamougue, who led the attack against the palace.

Apr. 18—The ruling military council appoints members to the 4 commissions that will act as supervisors of government functions.

CHILE

Apr. 9—The entire Cabinet presents its resignation to President Augusto Pinochet. No reason is given.

CHINA

Apr. 13—10 Nationalist Chinese, held prisoner for 25 years by Peking as "war criminals," arrive in Hong Kong, after their release under a special amnesty program announced last month.

Apr. 22—Belgian Premier Leo Tindemans ends a 4-day visit to Peking. He has met with Deputy Premier Chi Teng-kuei and Foreign Minister Chiao Kuan-hua.

CUBA

Apr. 11—The official newspaper *Granma* publishes a draft of a proposed constitution already approved by the Politburo of the Cuban Committee. If approved by the voters

in an upcoming referendum, the new constitution would provide for a National Assembly to be elected every 5 years by all Cubans 16 years or older. The Assembly would choose from its membership a 31-member State Council that would include a President, a first vice president and 5 second vice presidents.

CZECHOSLOVAKIA

Apr. 15—In a letter to the presidium of the Czechoslovak Federal Assembly, reprinted in *The New York Times*, former Communist party leader Alexander Dubcek denounces the present leadership of party leader Gustav Husak.

Apr. 16—In a speech to the Central Committee of the National Front, Husak states that Dubcek "can pack his bags tomorrow and move to any bourgeois state; he can go tomorrow to his patrons and his protectors."

Apr. 19—*Rude Pravo*, the party's daily newspaper, accuses Dubcek of betrayal and of attempting to withdraw Czechoslovakia from the Soviet bloc.

EGYPT

(See also *Intl, Middle East Crisis; Iran*)

Apr. 7—Palestine Liberation Organization leader Yasir Arafat confers with President Anwar Sadat in Cairo.

Apr. 12—President Sadat declares that the U.S. must insist on an Israeli withdrawal from territory Israel captured during the 1967 war.

Apr. 16—Because of the resignation of Premier Abdel Aziz Hegazi on April 13, President Sadat swears in a new Cabinet under Premier Mamdouh Salem, former minister of interior and police official. Lieutenant General Husni Mubarak, the air force commander, is appointed vice president.

Apr. 22—In Moscow, a joint communiqué is issued at the conclusion of talks between Foreign Minister Ismail Fahmy and Soviet Foreign Minister Andrei A. Gromyko.

Apr. 23—President Sadat and Syrian President Hafez al-Assad announce that they will set up a committee to unify strategy against Israel. This is the first time there has been an attempt at the top levels of the Arab governments to unify policy toward Israel.

FRANCE

Apr. 10—President Valéry Giscard d'Estaing arrives in Algiers; this is the first visit to Algeria by a French chief of state since Algeria won her independence from France in 1962.

GERMANY, FEDERAL REPUBLIC OF (West)

(See also *Iran*)

Apr. 24—In Stockholm, terrorists attack the West German embassy, kill the military attaché, take 12 hostages and blow up part of the building. Their act is a reprisal against the government, which refused to release 26 anarchists imprisoned in West Germany. The terrorists are believed to be part of the group that kidnapped West Berlin mayoral candidate Peter Lorenz in March.

Apr. 25—A Swedish spokesman announces that 4 of the 5 terrorists involved in the attack on the embassy in Stockholm have been arrested and will be deported to West Germany.

GREECE

Apr. 29—In Athens, U.S. and Greek officials agree to close the U.S. air base at Athens airport and end the home-port agreement for the U.S. 6th fleet at Eleusis.

HONDURAS

Apr. 17—A 7-member commission begins to investigate charges that Chief of State General Oswaldo López Arellano and Minister of the Economy Abraham Bennaton accepted a \$1.25-million bribe from the United States conglomerate, the United Brands Company.

Apr. 22—General López is overthrown in a bloodless coup by the Supreme Council.

Apr. 23—Colonel Juan Alberto Melgar Castro replaces President López.

INDIA

(See also *Sikkim*)

Apr. 7—Morarji R. Desai, former deputy prime minister and leader of opposition to Prime Minister Indira Gandhi, begins a hunger strike to protest the continued postponement of elections for the state assembly in Gujarat.

Apr. 19—The government announces the launching from the Soviet Union of its first space satellite. India becomes the 11th nation to orbit a satellite.

Apr. 21—The government introduces a bill in Parliament to make Sikkim the 22d state.

Apr. 23—It is announced in Moscow that India and the Soviet Union have signed a second-stage space agreement.

IRAN

Apr. 9—It is announced in Bonn, West Germany, that Shah Mohammed Riza Pahlevi is buying a 25-percent interest in Deutsche Babcock and Wilcox, A.G., a manufacturer of power generating equipment.

Apr. 14—In New York, the General Telephone and Electronics Corporation announces that it has received a \$500-million contract to install an expanded telephone system in Iran.

Apr. 24—In Teheran with visiting Egyptian President Anwar Sadat, Shah Mohammed Riza Pahlevi declares that Iran supports "the policies of Egypt 100 percent" in the Arab-Israeli conflict.

IRAQ

Apr. 2—Iraqi troops reoccupy border areas seized by Kurdish rebels a year ago.

ISRAEL

(See also *Intl, Middle East; Egypt; U.S.S.R.; U.S., Foreign Policy*)

Apr. 8—In Tel Aviv, Michael Tzur, a prominent business executive, is indicted on 14 counts, including bribery, fraud and larceny. At the time the alleged offenses were committed, he was managing director of the Israel Corporation, Ltd., an organization to stimulate investment in Israel, headed by Baron Edmond de Rothschild of Paris.

Apr. 11—A secret visit by 2 representatives of the Soviet Union with Premier Yitzhak Rabin and other Israeli leaders is revealed by high government officials. The last publicly acknowledged meeting between Soviet and Israeli officials took place in December, 1973.

Apr. 14—The government displays an Israeli-designed and manufactured jet fighter plane, comparable to the French Mirage and Soviet MIG-21 planes.

Apr. 16—In an independence day radio broadcast, Minister without Portfolio Israel Galili says the government will not meet with terrorists, but is willing to talk with representatives of the Palestine Liberation Organization (PLO) who recognize the existence of Israel.

Apr. 20—Rabin states that the government will not negotiate new proposals for a Middle East peace with the

U.S. until talks are resumed with Washington on Israel's arms requests. The U.S. State Department announced a "reassessment" of its Middle East policy last month after U.S. Secretary of State Henry Kissinger's mission failed.

Apr. 21—In Washington, D.C., Foreign Minister Yigal Allon meets with Kissinger.

Apr. 24—In a major new scandal, 8 defense ministry officials, a former brigadier general, and several private defense contractors are arrested on charges of bribery, fraud and embezzlement.

Apr. 29—A South African security officer who captured the Israeli embassy in Johannesburg yesterday surrenders; in the fighting to recapture the building, 4 people were killed and 32 were wounded.

ITALY

Apr. 19—President Giovanni Leone confers with Premier Aldo Moro and Interior Minister Luigi Guiato about the increasing political violence. 3 people have been killed and nearly 100 injured since fighting broke out April 16 in Rome among neo-fascists, leftists and police.

JORDAN (See Syria)

KOREA, REPUBLIC OF (South)

Apr. 3—Student demonstrators at Yonsei University demand the readmission to the university of the dissident students recently freed from prison. All classes are suspended; the president of the university resigns.

Apr. 8—Charging that national security is "endangered" by the war in Indochina, President Park Chung Hee declares a state of emergency, prohibiting all student demonstrations on campus. Armed troops seize the University of Korea campus, closing all classes. Classes are suspended at 2 other universities.

Apr. 9—8 men convicted by a military tribunal of being Communist spies are hanged publicly outside the Seoul Penitentiary.

Apr. 10—The government rearrests the 12 dissident student protesters in whose behalf the demonstrations began April 3.

LAOS

Apr. 15—King Savang Vatthana dissolves Parliament, effective April 10. Parliament was suspended in July, 1974; since then, the government has ruled by decree.

Apr. 23—According to government sources, the Marxist Pathet Lao is in complete control of the road junction at Sala Phou Khoun on Route 13, an important crossroads north of Vientiane.

LEBANON

(See also Yemen)

Apr. 10—Four American oil companies announce that they are closing down Tapline, the Trans-Arabian Pipe Line that supplies oil from Saudi Arabia to Europe via Lebanon, because of competition from supertankers and high losses.

Apr. 15—Fighting that began April 13 continues in Beirut between the guerrillas and the Phalangists. The death toll is reported at 100.

Apr. 16—Premier Rashid al-Solh announces that a ceasefire between the 2 factions has been reached.

PHILIPPINES, THE

Apr. 18—President Ferdinand E. Marcos states that he is calling a meeting of his Foreign Policy Council to dis-

cuss the Philippine take-over of the U.S. Clark Air Base and the Subic Bay Naval Base.

Apr. 25—The government formally notifies the U.S. that it wishes to review security agreements between the 2 countries.

PORTUGAL

Apr. 2—A 3-week-campaign period begins prior to the April 25 elections for the constituent assembly.

Apr. 4—All the major political parties agree to accept a new constitution drawn up by the armed forces. The constitution provides that for 3 to 5 years all essential power will be vested in the High Council of the Revolution, a group of 28 military officers.

Apr. 8—Officials reportedly inform the U.S. that it is "out of the question" for American planes to refuel in the Azores on the way to Israel under war conditions. The agreement between the 2 countries on the Azores expired in February, 1974.

Apr. 16—The military government announces that it will nationalize more basic industries (including the steel, electric, petroleum and transport industries), enact a land reform program, put a price freeze on basic foods, and establish a government work program.

Apr. 22—In Paris, the former minister of information and one of the original members of the committee that planned and executed the coup of April 25, 1974, Major José Sanches Osorio, announces that he is going into self-imposed exile.

Apr. 26—Almost complete returns from yesterday's election show the Socialist party winning 38 percent of the votes, the Popular Democrats receiving 26 percent and the Communist party receiving less than 13 percent.

RHODESIA

(See also Intl, OAU)

Apr. 4—On national radio and television, Prime Minister Ian Smith announces the release from detention of the Reverend Ndabaningi Sithole, at the request of the Bishop of the African National Council.

Prime Minister Smith invites Rhodesian black leaders to resume talks on the Rhodesian constitution.

Apr. 27—After a meeting of the African National Council, nationalist leaders refuse to meet with the government until the 1974 Lusaka agreements (providing for free political activity, among other terms) are met.

SAUDI ARABIA

Apr. 3—Crown Prince Fahd announces the government's decision to establish a national deliberative body to be called the Consultative Council. Details on its functions have not been revealed.

Apr. 6—The official press agency reports that King Khalid has granted amnesty to political prisoners in Saudi Arabia and to Saudis who left the country for political reasons.

Apr. 18—Sheik Ahmed Zaki Yamani, minister of petroleum, visits in Washington, D.C. for talks with U.S. Secretary of State Henry Kissinger.

SIKKIM

(See also India)

Apr. 10—The legislature votes to oust the King, abolish the monarchy, and seek full Indian statehood.

Apr. 15—It is reported that yesterday the electorate voted 59,637 to 1,496 to abolish the monarchy and to seek statehood with India.

SWEDEN

(See *Germany, West*)

SYRIA

(See *Egypt; U.S.S.R.*)

Apr. 25—It is reported in Paris, according to official information, that Jordan and Syria have agreed to establish a joint military command for their land and air forces. This action brings Jordan into the group of Middle Eastern countries receiving arms aid from the Soviet Union.

Apr. 30—King Hussein of Jordan assures visiting U.S. Secretary of State Henry Kissinger that there is no truth to the reported agreement between Jordan and Syria.

TAIWAN

Apr. 6—President Chiang Kai-shek dies at the age of 87.

Vice President C. K. Yen is sworn in as President.

Apr. 28—Premier Chiang Ching Kuo is confirmed as chairman of the ruling Nationalist party, the Kuomintang.

THAILAND

(See also *Intl, War in Indochina; Cambodia; Philippines*)

Apr. 10—Defense Minister Praman Adiraksarn reports fighting between Communist-led forces and government troops in Nan Province, which borders Laos. 16 people are killed and 20 wounded.

Apr. 16—Foreign Minister Chatichai Choonhavan announces that all Cambodian refugees flown in by the U.S. must leave the country within 30 days.

U.S.S.R.

(See also *Egypt; India; Israel*)

Apr. 8—4 naval task forces (nearly 200 ships) are reported on a worldwide exercise in the western Pacific Ocean. U.S. naval officials believe this is the largest exercise ever staged by the Soviets.

Apr. 9—Soviet trade statistics show a 1974 overall trade surplus of \$2.7 billion. The statistics also show a drop of 36 percent in U.S.-Soviet trade in 1974.

Apr. 11—The government signs an agreement to borrow \$250 million from a consortium of Western banks at an interest rate 1½ percent above the current London international bank rate. This is the largest loan the government has ever negotiated with private Western financial institutions.

Apr. 14—In a major policy statement, Premier Aleksei N. Kosygin warns the Arab nations that they must be "more unified" in their dealings with the U.S. and Israel when the Geneva peace talks resume.

Apr. 16—Tass, the official press agency, reports that Aleksandr Nikolayevich Shelepin, one-time head of the secret police and a powerful party official, has been removed from the Communist party's ruling Politburo. Shelepin's removal is the first change in Politburo membership since 1973. A successor has not been named.

Apr. 23—Foreign Minister Andrei A. Gromyko tells visiting Syrian Foreign Minister Abdel Halim Khaddam that the Soviet Union is prepared to guarantee Israel's existence as a separate independent state.

Apr. 28—Palestinian leader Yasir Arafat arrives in Moscow to confer with Soviet leaders about the Middle East situation.

UNITED KINGDOM

Great Britain

Apr. 1—With government approval, price increases go into effect on many goods and services; the government is at-

tempting to make nationalized industries self-supporting.

Apr. 9—The government proposes the establishment of a British National Oil Corporation to strengthen control of the nation's oil resources.

The House of Commons votes 396 to 170 to continue British membership in the European Economic Community (Common Market), although nearly half the Labour party members vote against the resolution. The question of membership will be submitted to the electorate in a referendum in June.

Apr. 15—Broadly based tax rises are announced by Chancellor of the Exchequer Denis Healey.

Apr. 18—The government reports that retail prices in the year 1975, through March, have risen 21.2 percent.

Apr. 26—A special conference of the Labour party votes against Britain remaining in the Common Market. The party will urge the voters to vote "no" in the June 5 referendum.

Northern Ireland

Apr. 7—With the death toll at 11 and the injured at 80 in one of the worst weekends in 6 years of fighting, the government asks for community help to end the violence.

UNITED STATES

Administration

Apr. 3—President Gerald Ford asks Congress to implement the Budget Control Act of 1974 one year early, in fiscal 1976 (beginning July 1, 1975), and to stop asking for additional money that may create more inflation.

Apr. 16—The Securities and Exchange Commission sues the Northrop Corporation for maintaining a secret and illegal \$30 million fund for political and other purposes.

Apr. 20—The President is reported to have selected former Ambassador to India Daniel Patrick Moynihan to succeed John A. Scali as chief U.S. representative at the U.N.

Civil Rights

Apr. 16—The North Carolina House of Representatives rejects the Equal Rights Amendment, voting 62 to 57. The amendment is not expected to win the votes of enough states to become law. It has been approved by only 34 of the 38 states needed for ratification.

Apr. 23—Acting under a 1973 law, Interior Secretary Rogers C. B. Morton returns the Menominee Indian reservation in Wisconsin to the Menominee Indians.

Economy

Apr. 3—The wholesale price index drops for the 4th consecutive month—by six-tenths of 1 percent—the Labor Department reports.

Apr. 4—The Labor Department says that unemployment rose in March to 8.7 percent of the labor force—8 million; "discouraged workers" who have dropped out of the labor market are estimated at 1.1 million. In 1940, 8.1 million were listed as unemployed.

Apr. 17—The Department of Commerce reports that the gross national product declined at an annual rate of 10.4 percent in the first quarter of 1975.

Apr. 22—The Labor Department reports that because food prices declined, overall consumer prices rose only 3/10ths of one percent in March, the smallest price increase in 20 months.

Apr. 25—The Commerce Department reports a trade surplus of \$1.3 billion for the 1st quarter of 1975. In the 4th quarter of 1974, imports totaled \$1.5 billion, more than exports.

Environmental Protection

Apr. 27—The Environmental Protection Agency urges the administration to slow the development of plutonium breeding nuclear reactors. It says that the Atomic Energy Agency has overestimated the rate of growth in the demand for electric power; problems of safety have not been resolved.

Apr. 28—A group of physicists selected by the American Physical Society expresses concern about the long-term safety of water-cooled nuclear reactors.

Foreign Policy

(See also *Intl, War in Indochina; The Philippines*)

Apr. 9—The White House issues a statement revealing that, in private assurances, President Richard Nixon told the Saigon government that the U.S. would "react vigorously" to a major Communist offensive.

Apr. 10—The President asks Congress to approve almost \$1 billion in humanitarian and military aid for South Vietnam without delay.

The President asks Congress for authority to use U.S. troops to evacuate Vietnamese who have been helping the U.S. from South Vietnam to protect them from the Communists.

Apr. 16—The President says the U.S. is responsible for "this present tragic situation" in Saigon.

Apr. 22—Plans to admit up to 130,000 Vietnamese and Cambodian refugees by waiving immigration restrictions are announced by the Department of Justice, acting on a request from Secretary of State Henry Kissinger.

Apr. 23—It is reported from Washington, D.C., that in a 2-hour meeting yesterday with Israeli Ambassador Simcha Dinitz, Secretary of Defense James Schlesinger gave Dinitz assurances that the U.S. will continue to support the security of Israel.

In a speech at Tulane University, President Ford declares that "as far as America is concerned," the Indochina war is over; he calls for "a great national reconciliation."

Apr. 30—A letter dated January 5, 1973, from President Nixon to former South Vietnamese President Nguyen Van Thieu is made public by a former Saigon Cabinet member. In the letter, President Nixon promised to "take swift and severe retaliatory action" if North Vietnam violated the Paris peace accords.

Labor

Apr. 16—The President acts under the Railway Labor Act to postpone for 60 days a threatened railroad strike by the Brotherhood of Railway and Airline Clerks.

Legislation

Apr. 10—Opposing President Ford, the Senate votes 60 to 25 to approve a measure setting a price ceiling on oil produced in the U.S.

Common Cause reports that candidates for Congress spent nearly \$74 million in their campaigns in 1974.

Apr. 22—The House of Representatives votes 248 to 166 to pass a bill increasing "target prices" and price supports for wheat, cotton, and livestock grain feeds and price support loans for milk products. The bill, which the Senate passed by voice vote, goes to the White House. President Ford is expected to veto it.

Military

(See also *Intl, War in Indochina*)

1—Selective Service officials say that the rule requir-

ing every American male to register for selective service within a month of his 18th birthday has been abolished; a once-a-year registration system will replace the old requirement and will be announced later in 1975.

Political Scandal

Apr. 17—Former Secretary of the Treasury John B. Connally is acquitted of charges of bribery; the former Texas governor had been charged with accepting \$10,000 in bribes from a dairy farmer organization in 1971.

Apr. 27—Senator Barry Goldwater (R., Ariz.) says that former President Richard M. Nixon should make a "full confession" about his role in Watergate so that he can become a Republican political asset.

Apr. 28—U.S. district court Judge John J. Sirica orders Watergate burglar James W. McCord's 1-to-5-year sentence reduced to 4 months.

Politics

(See also *Political Scandal*)

Apr. 16—The governor and the executive council of New Hampshire ask the state attorney general to ask the U.S. Supreme Court to resolve the dispute as to who will be the junior Senator from the state, Republican Louis C. Wyman, or Democrat John A. Durkin. Durkin won by 10 votes in a recount of the November election, but lost by 2 votes in a review of the recount. This was the closest race in U.S. Senate history.

Apr. 22—New Hampshire Attorney General Warren B. Rudman says he cannot in good faith appeal to the U.S. Supreme Court for a decision on the U.S. Senate seat because he believes that the question is political rather than judicial.

Supreme Court

Apr. 15—The Supreme Court rules 8 to 1 that it is unconstitutional for a state law to treat men and women differently; the decision voids a Utah law that sets different ages for adulthood for men and women.

Apr. 16—The Court rules 7 to 1 that a state may exempt individual violators from complying with air pollution rules without federal approval if the state maintains national standards for air quality.

VIETNAM, DEMOCRATIC REPUBLIC OF (North)

(See also *Intl, War in Indochina, Vietnam*)

Apr. 6—Elections are held for the 425-member National Assembly.

Apr. 20—Agence France-Presse reports from Hanoi that North Vietnamese civil servants of all grades are streaming into South Vietnam to administer areas abandoned by the Saigon government.

VIETNAM, REPUBLIC OF (South)

(See *Intl, War in Indochina, Vietnam*)

YEMEN

Apr. 24—The Middle East News Agency reports that Yemen has decided to close her embassy in Beirut, Lebanon, to protest an attempt on the life of a Yemeni diplomat.

ZAMBIA

Apr. 18—President Kenneth D. Kaunda arrives in Washington, D.C., for talks with government officials about the southern Africa situation.

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FOOD AND POPULATION IN AFRICA

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attempts to increase economic and social security in a situation of high risk. A peasant in Africa lives and works with the tiniest margin of safety. Experiments and innovations must be carried out with the greatest circumspection.

Of course, this description of African agriculture does not include every nation on the continent. In most of North Africa, land tenure reform began years ago and is well established, and agricultural techniques are more advanced. Several notable agricultural development projects, like the Gezira scheme for irrigated agriculture in the Sudan, have long offered a model of what might be accomplished. In many countries, there are important sectors of agriculture that produce market crops for export: cotton, coffee, sisal, cocoa, rubber, peanuts, and so forth.

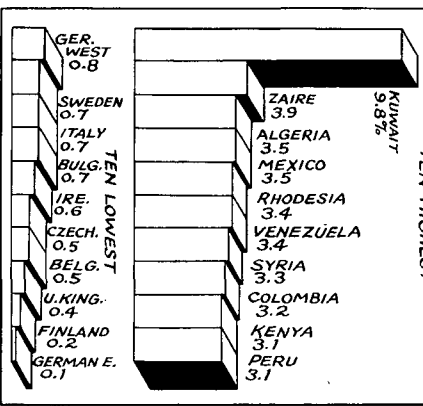
In government planning, agriculture appears to be receiving increased attention. Ghana's "Operation Feed Yourself" has been given a high priority by the government and appears to be achieving success. Algeria proposes to double her previous investments in agriculture during the present four-year-plan. In Nigeria, the newly announced five-year-plan will allocate six times more money to agriculture than before.

Across the African continent, increased attention to agriculture is absolutely essential if levels of nutrition are to be raised above their current very low levels and if the increased population is to be fed. In the end, the rural peasants are essential to changes in the rate of population growth and in the level of agricultural productivity. Recognition of this fact does not make the task easier, but it can help make the policy more effective. ■

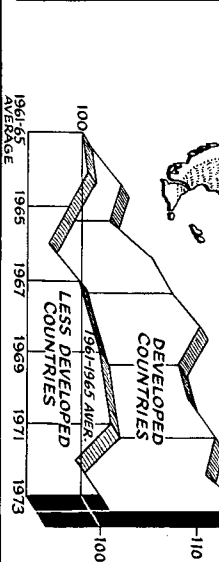
World Food and Population



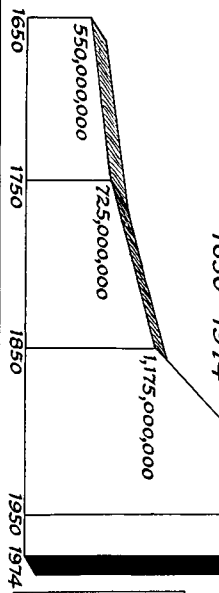
Population Density Percent Annual Growth



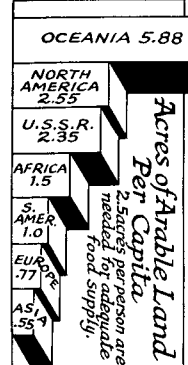
Per Capita Food Production



World Population Growth 1650-1974



Acres of Arable Land Per Capita



Comparative World Population (Figures in millions)

ASIA 2,214.7

EUROPE 638.5

World Total 3,807,400,000

AFRICA 398.7

AMERICA 327.4

PEOPLE'S REP. OF CHINA 780.

INDIA 574.2

INDONESIA 125.2

JAPAN 108.7

BANGLADESH 71.3

PAKISTAN 66.8

VIETNAM 41.9

PHILIPP. 40.2

THAILAND 40.

TURKEY 38.

R.O.F. KOREA 33.3

IRAN 32.0

BURMA 29.6

OTHERS 151.5

U.S.S.R. 250.9

W. GERMANY 62.

UN. KINGDOM 56.0

ITALY 55.2

FRANCE 52.3

SPAIN 34.9

POLAND 33.4

YUGO. 21.1

ROMANIA 20.8

OTHERS 133.9

NIGERIA 79.8

EGYPT 35.6

ETH. 5.1

RE. 23.6

OTHERS 209.9

UNITED STATES 211.2

MEXICO 54.3

CANADA 22.1

OTHERS 39.8

BRAZIL 105.

ENT. 23.9

AM. 23.2

ERS 6.1

IA 19.9

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